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‘I have seen the future’

Is Bush’s biofuels dream about to burst?

SPECIAL REPORT ON THE BIOFUEL REVOLUTION

TOO COOL FOR SCHOOL
How schools are hot-housing climate change

Red Bull
Why it’s called ‘crack in a can’

THE GODFATHER OF GREEN
Teddy Goldsmith past, present and future

Play FTSE for me
Why the Stock Exchange matters

‘PLEASE DON’T CALL US PROTESTERS’
The new breed of road ‘preventer’

FASHION SPECIAL How ethical clothes went from worthy to worth it
PLUS How to choose organic wine • Grow food in containers • Be healthy without pills • Plus several exclusive reader offers

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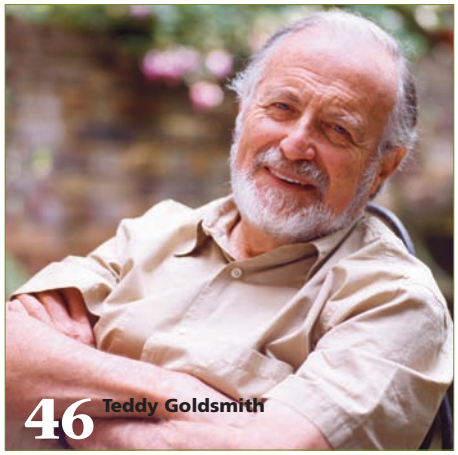

19-PAGE BIOFUELS SPECIAL

FEATURES

COMMENTS

REGULARS

GREEN PAGES

THIS MONTH IN HISTORY: MARCH 1937

70 years ago, On 1st Mar 1937, the first US permanent automobile license plates was issued to help distinguish between the growing number of cars on the road. By the end of 2005 that number stood at 603 million cars worldwide, plus 223 million further commercial vehicles. In 2005 alone, 46.5 million new cars were made, the most ever in a single year.

PHOTOGRAPH: CORBIS

ecologist
Founded in 1970

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EDITORIAL

When my uncle, who we interview this issue, launched this magazine 36 years ago, the world looked very different. At the time, awareness of environmental problems was only in its infancy, there was no such thing as a 'green' party and the first major oil crisis of the 20th century still hadn't happened.

Now we live in a world where everyone seems to be clamouring to keep up with the Greens. From politics to pop music, everyone wants to be involved. Only last week at the *Ecologist* we were contacted by agents of a reality television star to see if we'd cover his green work. We've had hardened prisoners offer their services. And on a larger scale we've seen dramatic announcements by Marks and Spencer and even Tesco about their plans to cut emissions and invest in energy-efficiency.

After years of berating the world for its inaction, we have to welcome this. But it leaves us with a nagging conundrum: scale.

In 2005, Walmart announced a global environmental sustainability programme focusing on three goals: to be supplied with 100 per cent renewable energy, to create zero waste, and to sell products that sustain the world's resources and environment.

Environmentally this is big news. By simply reducing the volume of the cardboard packaging on just one line of its own brand childrens' toys in 2005, for example, the company saved more than 5,000 trees and 1,300 barrels of oil. Last year the company also became the world's largest buyer of organic cotton at a stroke, when it purchased seven million kilos.

It would be strange if we didn't celebrate this fact. To not do so would almost vindicate the growing number of voices who declare that today, 'the environment is too important to be left to environmentalists'. But applauding the massive improvement in the buying patterns of the giant retailers doesn't preclude us from honestly and brutally examining the wider implications.

We've seen the effects on farmers and standards generally of the dramatic market imbalances in the food economy, for instance. What happens when what used to be labelled the 'alternative economy' falls under the control of the same corporate beasts that control everything else?

Who wins, and who loses? What will happen to the standards? Are the structures that are necessary to support these vast centralised operations even remotely compatible with a sustainable future? Can a sustainable economy be one in which a single company enjoys 40 per cent market share? How can Safeway, for instance be part of the solution to climate change for as long as it has only one milk distribution centre in the whole of England?

We need to ask these questions, and not be blinded by the exciting press releases. We should scrutinise the promises to ensure they're kept. But we need to do so subtly. Any legitimate environmentalist wants to see a race to the top among the biggest businesses. We want the big money managers to exceed the new standards of Goldman Sachs. We want Asda to leap ahead of Tesco, and Tesco to respond in kind.

But if we lose sight of the problems of scale, then these improvements will be short term. For in the end, despite our support for these companies' specific actions, the *Ecologist* has always maintained that in an ideal world, companies of that scale would not exist, and in their place would be the profusion of local diverse businesses that, up until now, such large, monolithic operations have both by design and by structure made increasingly obsolete.

letters

CARTEL CLAIM CHALLENGED

Solarcentury applauds *The Ecologist* for its support for the micro-renewables sector and its campaigning work on climate change. Long may it continue. However, we do take issue with the 'Solar Cartel' article (February). The factual errors and misleading innuendo in the article may have given some readers a false view of solarcentury. Solarcentury is the UK's leading solar solutions company. Formed nine years ago, we have to date installed more than 500 large-scale commercial and public sector solar PV installations and literally thousands of home systems, both directly and through our growing network of local and regional associate companies. For the article to imply that this company has no track record in this industry is simply incorrect.

In addition, the innuendo in the published quotes from Mr Bhatia misrepresented our actions throughout a very tough and scrupulous DTI tender process for Phase 2 of the Low Carbon Buildings Programme. Fifty-three companies submitted formal Expressions of Interest to the DTI. Of these, 43 companies were invited to tender in September 2006; 28 companies submitted a full tender and 15 of these were invited to interview. Solarcentury won one of the seven tenders awarded.

Anyone who witnessed the then Energy Minister's feisty exchanges with me on the September 2006 Labour conference fringe in Manchester, can be in no doubt that the idea of us engaging in a 'cartel stitch-up' with the DTI at the same time is laughable. Or it would be if the entirely false allegations being made by Mr Bhatia were not so serious.

As a company, we have of course always met with DTI and other government officials, invariably to point out the shortcomings in government micro-renewables policy. We have a long and very proud track record of totally ethical engagement with government to promote the interests of the entire UK PV industry and we will continue to do so. I would invite your readers to visit our website at www.solarcentury.com for further information on our commercial and lobbying activity.

Dr Jeremy Leggett
CEO solarcentury

Editor's response: *The Ecologist* fully recognises Solarcentury's pioneering role in promoting sustainable energy solutions and apologises for any misleading inference in the article.


RADLEY LAKES

Still waters
RUN DEEP

When the local power station wanted to fill in their local lake with ash, a group of ordinary people from Oxfordshire decided enough was enough.
By Paul Kingsnorth

RADLEY LAKES

Coal burning creates a huge amount of localised waste. Didcot can produce 3,000 tonnes of waste ash in a single day

DEVELOPING KYOTO 2

Oliver Tickell's idea (Kyoto 2, February) has the very great merit of low costs of implementation. The number of producers of fossil fuels is very much less than the number of consumers. However, I see huge problems persuading countries that their fossil birthright should be subject to an international tax. My suggestion for a possible amendment to the idea is that all the revenues from the scheme be remitted right back to the country in which the fuel originated. That way, no country will refuse to participate because it loses revenues. Of course, then we wouldn't have funds to re-forest or put our cities on stilts. But we would have got a viable scheme for a global pricing of carbon, which is what I think Oliver sees as the first objective.

Chris Goodall, by email

MORE RADICAL AT RADLEY

Paul Kingsnorth's article on Radley Lakes (November) helped to stir radical action.

● On 28 December, a small group of activists, including two from previous road campaigns, occupied a house owned by Npower on the edge of Thrupp Lake – the nature reserve marked down for destruction. Among the four

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

ECOLOGIST POLL

Do you think the solution to the UK's transport problems involves building more roads? (See Paul Kingsnorth's article *Road Rage*, page 50.) Go to www.theecologist.org to cast your vote. In last month's poll, 88 per cent of you said you thought introducing personal carbon quotas is a good idea.

were Baptist minister Malcolm Carroll (yep, that's me, doing it in my time off).

- Other experienced protestors – experienced in anti-road site techniques – have gone to the house. Some really impressive lock-ons have been constructed, above and below ground.
- We've also had support from activists at Bling (Southend), which boasts probably the deepest tunnel system in the UK protest scene.
- Next big date: 24 January, when Npower will (almost certainly) prove their ownership of the site, where the County Court will (very probably) issue an eviction notice. We will try to get a delay on when that notice becomes operative.
- Assuming a defeat in court, those locked-on will stay locked and those dug in will stay dug.

Malcolm Carroll, by email; www.saveradleylakes.org.uk

KING IN NAME ONLY

I do not believe that Sir David King should be applauded on the basis of one pronouncement on the climate that states the obvious. It is clear from the recent *Ecologist* interview (February 2007) that he exemplifies the worst kind of scientific arrogance. We are only in this global mess because scientists have provided the wherewithal for humans to wreak havoc on their environment – yet he persists in the belief that science will solve all our problems, while continuing to support activities that will dig us in even deeper. He believes that his knowledge is absolute and unassailable – yet does not grasp the difference between plant breeding and genetic modification. He derides the notion of the precautionary principle, arguing semantics – yet during the BSE crisis, pets and organically-reared animals that posed no threat were compulsorily slaughtered, even when this was plainly not necessary – presumably as a 'precaution'. With men like this in positions of power I see little hope for humanity.

Veronica-Mae Soar, by email

MY UNHAPPY VALENTINE

I was horrified to read in your Green Pages, suggestions for Valentine's Day gifts including 'wild snowdrops from a local woodland or riverbank'. The last I knew, picking wild flowers was illegal; besides which, as a magazine professing a love of ecology, to suggest raiding wild woodland seemed a bit hypocritcal. I'd have thought that suggesting that readers boycott this unnecessary and overcommercialised day would have been more in line with the principles of *The Ecologist*.

It seems a sad reflection of today's society that we need to single out one day a year to profess our love for another human, and demonstrates again the waste in our society that yet another 'celebration' day costs the environment, in terms of more wasted gifts, cards, etc, not to mention all the associated packaging.

Perhaps it would be better in future to suggest that if we wish to mark Valentine's Day, we should use it to demonstrate our love for the planet, perhaps by planting a tree or native plant, instead of suggesting removing them from their rightful and natural habitat.

Fleur Elliott, by email

THIS BIRD HAS FLOWN

I'm a little upset that bird flu has fallen off the media radar; I really enjoyed the reports of dead swans in Scotland. As an environmentalist one should argue the defence's case for bird flu. Surely a good dose of H5N1 is what the planet really needs. Just think of the environmental benefits:

1) A complete stop to all international air travel for two years – which would set the airline industry back decades.

2) A reduction in the earth's population by 10-20 per cent – fewer people, less consumption.

3) People would be less mobile, frightened to go out – less use of cars, holidays, etc – all carbon-intensive activities.

So, OK, the drawbacks – you may get seriously ill; you may die; loved ones will die. But it may provide valuable breathing space the planet needs.

Rob Golding, by email

BEATING DENIAL

I was very interested to read Pat Thomas's timely article 'How to beat denial – a 12-point plan' – as part of your Stern Review focus (December/January issue). Individual response to climate change – or, rather, the overwhelming lack of it, has been dogging my thoughts.

While Pat Thomas usefully leads up to an Action Plan based on tackling all aspects of denial, and I agree with what she says, there is a more fundamental and challenging obstacle to mass individual lifestyle changes. Denial requires *thinking* about climate change, and I'm convinced that it simply washes over most people in the so-called developed world. This is rooted in disconnection with nature going back several generations, and the dearth of individual action is especially exacerbated by lack of personal responsibility realisation, selfishness, and old habits dying hard.

So what's the solution? I have been involved in nature conservation for almost all of my working life, but find it increasingly hard to be what essentially underpins environmental commitment – optimistic. What will it take to really catalyse mass individual action? Nothing short of rising seas – perhaps in the South East of England – but would it then not be too late? Perhaps our best hope lies with enough political greening in time!

Alan Drever, Isle of Skye

CO-OP CO-OPTED?

Does anyone else think it strange that the Co-operative Bank is offering cheap air travel as an incentive for signing up to their new credit card 'Travel Card'? (I think you get air miles or something similar.) I bank with the Co-op and the last time I was on the phone to them they offered me the card and explained the 'perks'. I did mention then that I didn't really think it was in keeping with their ethos, but the lady just laughed and said, 'Oh yeah, I hadn't thought of that!' Hmmmm....

Donna Reed, by email

Readers are encouraged to let the Co-operative Bank know what they think at customerservice@co-operativebank.co.uk

up front

WHAT WE LEARNT THIS MONTH...

■ **Nine volunteers who agreed to live on an ape's diet for 12 days for a TV documentary lost weight, substantially decreased their cholesterol and blood pressure levels and said they felt more energetic. The diet included 2,300 calories of fruits, vegetables, nuts and honey each day. Fish oil was introduced part way through the experiment to reflect a hunter-gatherer's diet.**

■ Pop stars J-Lo and Beyonce were paid $10,000 each to wear diamonds to the premiere of Leo De Caprio's latest movie *Blood Diamond* – which portrays diamonds as a warlord's best friend – as part of a multi-million pound campaign to avert a backlash against the industry.

■ **The founding chairman of the all-party committee on climate change Colin Challen is standing down and is expected to leave politics at the next election. Friends say he wants to do something constructive to tackle climate change.**

■ Mobile phones could be the cigarettes of the 21st century in terms of damage they cause to public health, says leading expert and government adviser Professor Lawrie Challis. A European study has 'hinted' that excessive use over 10 years may increase the risk of brain tumours.

Supermarkets battle for green pound

Stung by rising public ire that their corporate practices are contributing to climate change, two of the UK's leading supermarkets have announced a raft of initiatives to turn their operations 'green'.

M&S were first off the blocks, introducing sustainable fish and organic, Fairtrade cotton clothing, and undoubtedly the warm reception they received from consumers acted as a catalyst for Tesco to follow suit. M&S are forecast to make a £1bn profit this financial year for the first time in a decade.

Building on this success, M&S has launched a 100-point plan to transform their operations by 2012. The £200m eco-plan means that M&S will become carbon neutral and send no waste to landfill, while pursuing policies to extend sustainable sourcing, set new standards in ethical trading and help customers and employees live a healthier lifestyle.

Not to be outdone Tesco chief executive Terry Leahy rose to the challenge and pledged to spend £500 million on energy efficiency by 2012.

Leahy promised independently-audited cuts in carbon emissions from its operations, support for the development of emerging low-carbon technologies and carbon labelling on all of its products – although he failed to say by when this latter commitment would be achieved.

Both stores received plaudits for their moves from environmental campaigners.

"If every retailer in Britain followed M&S lead it would be a major step forward in meeting the challenge of creating a sustainable society," said Blake Lee-Harwood of Greenpeace UK.

Walmart, the US Tesco, who announced their own plans to achieve carbon neutrality last year, are the target of a consumer boycott. The Organic Consumers Association in America say the company is ambiguously signposting goods as organic leaving consumers confused as to what is and what isn't. They are also concerned that Wal-Mart is selling cheap 'organic' food by sourcing products from China, Brazil and other nations, where labor and environmental standards are lax, and for its over-reliance on factory-farmed 'organic' milk at the expense of smaller, local suppliers.

75%

The proportion of British consumers who say products have excessive packaging, a Europe-wide Ipsos Mori poll has found.

More than 50 per cent of the 1000 Britons polled found packaging too difficult to open and only 35 per cent admitted to reading the label, raising a question mark over the validity of nutritional health warnings.

The poll found the same proportion of German, French and Swedish consumers agreed. Italian and Czech consumers were least concerned. Packaging has increased by 12 per cent since1999 and accounts for one third of an average household's waste.

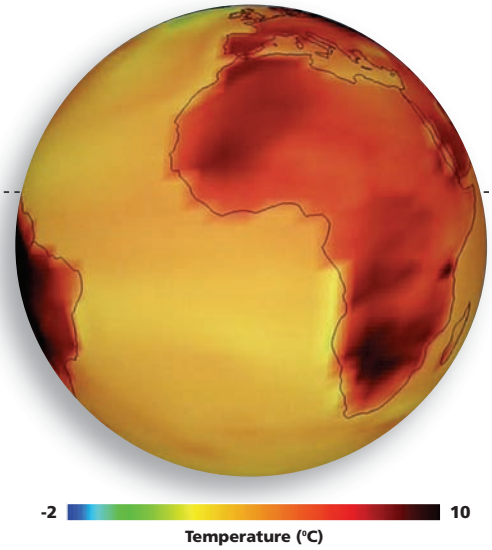
This far and no further?

The Competition Commission has published an interim report on its ongoing investigation into market domination of the UK's major supermarkets.

Peter Freeman, Chairman of the Commission, warned that it did not exist to 'punish success or individual retailers,' but added that 'we are concerned with whether Tesco, or any other supermarket, can get into such a strong position, either nationally or locally that no other retailer can compete effectively.'

Of particular concern is Tesco's 'land bank' – a stock of undeveloped land across the country which, if built on, could raise Tesco's market share from its current 30 per cent to a competition-stifling 45 per cent.

The Commission plans to investigate the issue further, focusing on the amount of time a retailer is allowed to hold land undeveloped.



Above: Latest statistics reveal that the Greenland ice sheet melt is two to three times greater than expected. Right: The Hadley model of temperatures in 2099

Climate change warnings intensify

A flurry of climate change reports and conferences have confirmed the worst; that we no longer face climate change but climate catastrophe unless we act immediately to curb manmade emissions of greenhouse gases.

The best case scenario comes from the Inter-Governmental Panel on Climate Change, whose latest report warns that average temperatures could rise by 4.5°C if carbon dioxide levels double over pre-industrial levels (280ppm) by the end of the century. However, the report adds a chilling caveat that 'values substantially higher than 4.5°C cannot be excluded'. This is in line with the Stern report (and Hadley modeling) which concluded that we could not act fast enough to stop CO_2 levels reaching 500ppm by 2050; today CO_2 concentrations are around 380ppm and rising.

The report warns that there will be more severe climate shocks, sea levels will rise by between 11-17 inches, heatwaves, floods and droughts will become more severe and frequent.

But eminent German and American scientists have already accused the report of being 'conservative' and sugar-coated.

For instance a study in the peer-reviewed journal *Science* forecasts sea-level rises of between 20-55 inches by the end of the century. And Ohio State University Professor Lonnie Thompson, a polar ice specialist, has said 'they don't take into account the gorillas – Greenland and Antarctica. I think there are unpleasant surprises as we move into the 21st century.'

Michael McCracken, who until 2001 coordinated the official US government reviews of the international climate report on global warming, has fired off a letter of protest over the omission. As the *Ecologist* revealed last month, the current rate of melt of the Greenland Ice Sheet is two to three times greater than expected and it is now feared that this will accelerate exponentially.

Further evidence of accelerated climate change has been reported by the UN Environment Programme. Thirty benchmark glaciers monitored by the World Glacier Monitoring Service lost about two feet of thickness on average in 2005 – indicating a melt rate 1.6 times faster annually this decade compared with the Nineties and about six times faster than the Eighties.

Bright idea

In an unprecedented move to reduce energy use, California is considering a ban on the sale of incandescent lightbulbs.

The 'How Many Legislators Does it Take to Change a Lightbulb Act' would ban incandescent lightbulbs by 2012 in favour of energy-saving compact fluorescent lightbulbs, which use about 25 per cent of the energy of conventional lightbulbs.

No fly organic

The Soil Association has said that it may withhold its prestigious stamp of approval on produce that had been transported by plane, in response to growing demand from the public. Addressing the SA annual conference, director Patrick Holden said that everything that could be done to tackle global warming should be, adding that careful consultation would be needed to ensure that producers in developing countries were not disadvantaged.

BUSINESS AS USUAL

A survey of chief executives around the world, released at the World Economic Forum in Davos, Switzerland, last month, found widespread optimism about profits, only tacit concern about global warming, and a fear of over-regulation.

Forty per cent of the chief executives surveyed said they were either somewhat concerned or extremely concerned about global warming. But in the US, the figure was only 18 per cent, compared to 49 per cent of chief executives in China, 60 per cent in South Korea and 70 per cent in Japan.

Russian executives were even less worried than the Americans. Just one of the 31 Russians interviewed admitted to having a moderate concern about global warming.

The survey of 1,084 executives found that only 46 per cent of the companies said they had spent some money on climate change, but in the US the figure was just 26 per cent.

Over-regulation is a greater concern to bosses in Europe and the Americas than the risk of a downturn in major economies, which is of considerable concern in Asia. More than 50 per cent of Western chiefs feared 'over-regulation' while between 45-87 per cent of Asian chief executives are more fearful that the export boom to the West maybe nearing its end.

Come fry with me…

Michael O'leary, owner of Ryanair, and Thomson holidays have fired a warning shot across the chancellor's bows over the recently introduced £5 climate change tax on budget flights.

Describing the Chancellor's tax as 'ridiculous and anti-consumer', Ryanair has asked flyers to email 'Greedy Gordon' telling him to 'keep his hands off your low fares'. Thomson are asking their customers to do the same. Airlines account for 5.5 per cent of current annual GHG emissions and in 2005 around 77 million people flew out of Britain on low cost airlines.

Not to be outdone and encourage the Chancellor's all too timid step Plane Stupid want people to let him know he should stick to his guns and possibly go further. Readers can mail Gordon Brown at mailto: ministers@hm-treasury.gsi.gov.uk – outlining their support for the increase in Air Passenger Duty, and requesting a further increase in the Spring Budget. And you can let Ryanair know what you think too by emailing Caroline Green, head of customer affairs, at (ironically) greenc@ryanair.com

Campaign Watch

EXTEND JUNK-FOOD BAN

The food and farming charity, Sustain, is calling on TV regulator Ofcom to extend it ban on junk-food adverts targeted at children to after the 9pm watershed, as surveys reveal two thirds of children are watching television outside these times. The current ban only covers dedicated children's programming. To support the call write and ask your MP to sign Early Day Motion 404, which would force Ofcom to legislate against all junk-food advertising until after the watershed. For more information visit www.sustainweb.org or phone 0207 837 1228.

Save Royal Parks' trees

The Royal Parks Foundation, the charity for London's eight Royal Parks, has launched a fundraising campaign to help support trees damaged in January's gale-force winds.

Over 100 trees were lost, a greenhouse roof broken and a 200ft section of wall blown down in the winds, causing tens of thousands of pounds of damage.

'We desperately need the public's support to replace the lost trees and care for damaged specimens across the Parks,' said the Foundation's Chief Executive, Sara Lom.

To support the Royal Parks' appeal, visit www.justgiving.com/parktrees

Call for tranquility

The Campaign to Protect Rural England (CPRE) recently released an acoustic map of the UK, detailing where the most, and least, tranquil parts of the country are to be found.

Now, CPRE are calling on the public to play a role in preserving and enhancing this tranquility. The group urges you to write and ask your MP to support a Ten Minute Rule Bill sponsored by John Penrose MP. The Bill aims to protect tranquil, rural spots from the intrusion of towns, roads and aircraft. For more information, email campaigns@cpre.org.uk, or phone 020 7981 2869.

Farmers' market threat

Britain's flagship farmers' market, Borough market in London is under threat from developers. Planning permission has been granted for a railway line to run through the roof of the market, which would involve knocking down 23 of the beautiful listed and unlisted buildings in the surrounding area.

However, funding for the scheme has yet to be secured and a campaign has been launched to save the area, which has been home to a market from Roman times, from development.

For more information and to sign the petition to save Borough market visit www.sabmac.co.uk

GOOD BOOKS

One woman's campaign to clean up the world of book publishing has caused a revolution within the industry. In October, Matilda Lee reported on the work of Alison Kennedy, Production Director at Egmont publishers, who has championed the use of pulp from sustainable forests in book publishing (*Ecologist*, October 2006, 'Local Hero'). She developed a grading system for paper, ranging from Grade I (source unknown), through to Grade V (FSC-certified recycled paper).

Globally, there are over 788 million books printed every year. Between 15 and 25 per cent of these use papers which are from untraceable, and possibly illegal, sources of pulp. Now, after six years of lobbying, Kennedy has persuaded 10 leading publishing houses to adopt her grading system. This transparency will make it much easier for publishers to make ethical choices over the materials used to produce books.

Biofuels 'disaster'

Scores of environmental groups and NGOs from around the world are calling for a moratorium on EU biofuel targets to protect natural resources and local communities in the southern hemisphere.

Instead of boosting biofuel production with disastrous social and environmental impacts, the EU should focus on drastic reduction of energy use and support for genuinely sustainable renewables, the authors say.

In an open letter, the organisations warn that 'the proposed targets will promote crops with poor greenhouse gas balances, trigger deforestation and loss of biodiversity and exacerbate local land use conflicts'. The letter continues that 'not only is deforestation itself a major cause of CO2 emissions, but biodiesel from South East Asian palm oil (where most world palm oil currently originates), can be expected to cause between two and eight times as much CO2 emissions from damage to peat as the emissions from the fossil fuel diesel it replaces'.

Separate letters of protest have been sent from five large networks of Latin American organisations – who fear for their future food sovereignty – and Indonesian NGO Sawit Watch. The letter is now open for signature and can be found online on www.biofuelwatch.org.

4.3

BILLION TONNES

The volume of effluent dumped into China's Yellow River in 2005, up from 3.4bn tonnes the previous year, resulting in the extinction of a third of the fish species that had previously been found there.

Tortilla wars erupt

Around 75,000 people took to the streets in Mexico City on January 31 protesting at the rising price of tortillas, which is blamed on the use of maize to produce biofuel.

The price of tortillas, a staple of the Mexican diet, has doubled over the past year to around 10 pesos per kilo, which is what a typical family will eat in a day. In Durango state, the price has has hit 30 pesos per kilo. Mexico's minimum wage is just over 45 pesos per day.

The Mexican Government is blaming farmers for speculating on price rises and hoarding stocks for creating the food V fuel conflict.

See Biofuel Report, page 27

Airport poll was rigged

TAG Aviation, the operators of Farnborough Airport in Hampshire, have been caught rigging an online poll held by a local newspaper – in the hope of swaying planning permission in their favour.

In the week prior to its publication, the poll – which asked whether residents would favour a doubling of weekend flights from 2,500 to 5,000 – had shown a groundswell of opinion against TAG at 2:1. But when the results were published, the vote showed that 63 per cent of respondents said that they would be in favour of an increase in flights.

Smelling a rat, the newspaper's owners followed up a tip-off by a TAG employee, and discovered that the company had emailed all its employees asking them to vote for an increase in flights.

Brandon O'Reilly, Chief Executive of TAG Aviation, said: 'All TAG employees at Farnborough Airport were made aware of the poll and encouraged to participate.'

TIMBER TRAUMA

The UK is the world's third largest importer of illegal timber, behind China and Japan, a World Wildlife Fund study has revealed.

The report *Illegal Logging: Cut It Out* shows that 3.2m hectares of illegal wood enter Britain each year.

For more information www.wwf.org.uk

SEAS NEED SAVING FROM DESTRUCTION

Conservation group WWF has revealed a number of marine locations around the UK that are in urgent need of protection before biodiversity damage reaches irreparable levels. The report – *Marine Biodiversity Hotspots in the UK: their identification and protection* – has been produced to draw attention to the issue and reiterate the need for a hard-hitting Marine Act.

The named hotspots were chosen for their diverse populations of wildlife and habitat richness that include representative, rare and threatened species. The five locations highlighted in the study are Plymouth Sound in South Devon, The Blackwater Estuary in Essex, The Dogger Bank in the Southern North Sea, Rathlin Island in Northern Ireland and The Menai Straight in Wales.

'Our seas are becoming busier than ever before due to an increase in human activities threatening the marine environment,' said Kate Reeves, WWF Marine Policy Officer. 'These pressures would be alleviated if the UK government introduces a long-awaited, robust Marine Act with a new integrated marine planning system.'

The long road home: in the immediate aftermath of their court victory the joyous people's of the Kalahari began to head back to their homeland

Bushmen struggle to return to Central Kalahari

Botswanan police are refusing to allow Kalahari Bushmen to return to their ancestral homelands, despite their having won a landmark high court case allowing them to do so, ***writes Clive Dennis***.

On December 13 last year the Bushmen finally succeeded in their four-year struggle for justice in the courts of Botswana, challenging their eviction from the Central Kalahari. In contradiction of the ruling, however, the police declared independently in January that the court decision applies only to those 239 Bushmen who had originally brought the case, rather than the thousand or so who had been living there until the evictions first started in 1997.

As a result families have been split in two, as many of those who were included on the court list have had to leave their wives and children behind the police lines on the edge of the Central Kalahari Game Reserve (CKGR).

In 2002, the Bushmen of the Kalahari filed a claim against the Government of Botswana challenging their recent forced removal from their homelands, which was in violation not only of International law, but also of Botswana's constitution. In what was to become the longest and most expensive court case in Botswana's history, the Bushmen, described during the proceedings as 'Stone age creatures' by Festus Mogae, the President of Botswana, gave evidence which cast the country's government in a far less favourable light than it has been used to in recent years, having previously gained the reputation for being a demonstration of a successful modern democracy in the heart of Africa.

The battle dates back to 1991 when a number of Bushmen set up their own organisation, First People of the Kalahari (FPK), in order to defend their rights to their lands and to their chosen way of life. FPK began supporting Bushmen who needed legal help defending their right to hunt and carried out a mapping project in order to get Bushmen communities recognised as official residents of the CKGR. Very quickly, they became targeted by the Botswanan government in a campaign of surveillance and vilification. In 1996, it became official policy to evict the Bushmen. Officials openly declared that this was in order to make way for diamond mining.

Photos: Fiona Watson/Survival & Picture Botswana/Survival

Far left: Roy Sesana, lead applicant in the landmark case

Soon after this change in policy, the evictions began in earnest, and government trucks began rolling onto the reserve to remove the Bushmen. The Bushmen resisted, however, and kept on returning to the reserve, despite the increasing difficulty and danger of doing so. Limitations were put on what the Bushmen were allowed to hunt, and a permit system was introduced, whereby individual Bushmen were required to apply for hunting permits – a difficult task for a people who are largely unable to read, and who have no means to travel to the offices where they are issued, hundreds of miles away.

The government then removed the pump from the borehole which the Bushmen used for their water supply. But still, in the face of these hardships, many families remained. It was then decided that the Bushmen would have to be encouraged off the reserve by other means.

By February 2002, hunting and gathering were banned altogether and later, so was the keeping of domestic stock. Wildlife wardens threatened the Bushmen, tied them to vehicles for days, destroyed dwellings and shot holes in their water tanks. Forty-four cases of torture were reported. One man was castrated. Several died from beatings.

In this manner most of the Bushmen had, by 2005, been persuaded to leave, though a few still held out, their off-reserve relatives doing their best to smuggle food and water past the park officials. Many still kept on trying to return.

Once most of the inhabitants had been removed, a large part of the CKGR was staked out for diamond concessions, the primary claimants being De Beers, who work in partnership with the Botswana government, and another company, BHP Billiton.

The Bushmen were relocated to New Xade, a parched settlement on the edge of the reserve, where game was scarce and hunting no longer even a possibility. In the years that followed, the Bushmen lived on government handouts and alcohol. Some became prostitutes, and the first instances of AIDS occurred. In

the midst of this, the Bushmen, with international support from charities such as Survival International, brought a case before the Botswanan courts, challenging the legality of the evictions.

After prevaricating, the government went as far as changing the constitution during the course of the court case, removing the section which declared the rights of the Bushmen to the CKGR. They were, however, becoming increasingly embarrassed by the international campaign supporting the Bushmen, as were De Beers, the diamond traders set to benefit most.

In December 2006, the court finally ruled in favour of the Bushmen, declaring the government's eviction 'unlawful and unconstitutional', and that the Bushmen have the right to live on their land inside the CKGR, hunting and gathering, without a requirement for permits. The Bushmen were ecstatic. 'We have waited for this moment for so many years, and now we are finally going home!' said one Bushman, a member of a group who started preparing to return home as soon as the judgement was passed. 'I will build some huts for my family, and teach my young children how to find food. My heart is full of joy, knowing that soon I will see my land again.'

Even in light of the High Court decision, the government has still not given up in its attempts to keep the Bushmen out of the Kalahari, and President Mogae greeted the ruling with a speech, encouraging the bushmen not to return. Then the police barricades were erected.

The FPK, on behalf of the Bushmen of the Central Kalahari Game Reserve, is now appealing to the international community to help them secure their hard won rights. In a statement they said, "As First People of the Kalahari and residents of CKGR we appeal to the President, Cabinet and all Botswana to leave us alone to go home. The President has said that we should not go backwards but should go forward. This is good advice. So we will go forward fighting for our rights to the Central Kalahari Game Reserve."

The Bushmen have won one battle to decide the direction of their lives but, as for tribal peoples the world over, the war continues in earnest.

For regular updates on the Bushmen's struggle, visit www.survival-international.org

BEHIND THE LABEL

RED BULL

It has spawned a dozen urban legends. It gets praised and reviled by bloggers. And it tastes like carbonated cough syrup. But does Red Bull do you any good? **Pat Thomas** reports

The global energy crisis isn't just a problem for cars. Humans across the globe are also suffering a chronic lack of vim and vigour – and wherever something is lacking, you can be sure there will be a product to fill the hole. Enter the energy drink. There are hundreds now on the global market, but only one, Red Bull, has consistently been a market leader.

Released onto an unsuspecting world in 1987, Red Bull created a whole new drinks category. The global 'health' and 'energy' drinks market is now the fastest-growing in the soft drinks world, doubling in size every year since it was first identified, to reach £1.5 billion in sales in 2006. Red Bull leads the way, with sales in the region of £1 billion last year.

'Red Bull's effects', says the spin on the iconic blue and silver can, 'are appreciated throughout the world by top athletes, busy professionals, active students and drivers on long journeys.' Such claims for enhanced performance and increased concentration and reaction time are tenuous at best, culled from studies financed by Red Bull and involving small groups of human guinea pigs. Other similarly small independent studies show little or no such effect from this carbonated concoction.

No wings, but lots of spin

Despite the mystique and the sales slogan that 'Red Bull gives you wings', there is no magic to Red Bull. It may not literally live up to its nickname of 'crack in a can', but the mixture of sugar and caffeine can have a powerful and immediate effect.

The caffeine – 80mg per can, more than three times what's in the same amount of a Coke, but a similar amount to a cup of strong coffee – produces the trademark 'buzz'. But sugar is the only ingredient in Red Bull that actually supplies ready 'energy' – and, being refined sugar, the 'high' is at best short and unsustainable and can, with continued consumption, depress immunity and wreak havoc with the body's own energy-producing systems. To put Red Bull's sugar content into perspective, the UK Food Standards Agency defines a high-sugar product as containing 10g per 100g. Red Bull contains 11.3g per 100g – a mighty 28g of simple carbohydrates per can.

Added to all this caffeine and sugar are the amino acid taurine (also known as 2-aminoethanesulfonic acid) and a rather mysterious carbohydrate called glucuronolactone, plus a range of B-vitamins (most in amounts too small to be considered therapeutic).

Taurine occurs naturally in meat and fish and is involved in several of the body's metabolic processes. Omnivores on a good diet get all they need from food. There is no Recommended Daily Amount (RDA) for taurine and no authority has identified what the maximum safe daily intake is. But data from the Austrian National Food Authority suggests that the amount of taurine in just two cans of Red Bull is around five times that in an omnivorous diet. Similarly, intake of glucuronolactone (a metabolite, or breakdown product, of glucose) from two cans of Red Bull is in the order of 500 times what humans would normally get from food.

Although taurine has a calming effect on the central nervous system and lowers blood pressure, these effects need to be judged in relation to the caffeine in Red Bull, which has the exact opposite effect, and the potential havoc that combining these ingredients could play on the body. Each of the ingredients in Red Bull clearly has the capacity to produce its own adverse effects; but they can also interact. Given this, it is all the more amazing that there is no long-term research on how sugar, caffeine, taurine and glucuronolactone might interact in the body.

Implied health warnings

This has worried several health authorities around the world. Red Bull has recently been banned in France. A threatened ban in Turkey was narrowly averted when the company reformulated its product there, approximately halving its caffeine content. In Sweden, Denmark and Norway, Red Bull is a medicinal product; and in Japan, until recently, it was available only in pharmacies. In Canada, where it has only relatively recently been allowed on sale, the product carries the warnings: 'Not recommended for children, pregnant or breastfeeding women, caffeine-sensitive persons or to be mixed with alcohol. Do not consume more than 500 ml per day.'

No warnings are put on the can in the UK except the one required by EU regulation, that all drinks (except tea and coffee) containing more than 150mg of caffeine per litre must state 'high caffeine content' on the label.

Part of the concern is that while Red Bull is marketed as a healthful drink, it doesn't do anything to nourish the body or replenish it after physical exertion. In fact, because of the drink's high caffeine

content, it can be dehydrating. For a person engaged in heavy physical activity, adding Red Bull can be a lethal mixture. A small number of people have died from heart failure after combining Red Bull with physical exertion and, while no direct causation has been attributed to Red Bull, the dehydrating effect of the drink combined with exercise has been mooted as a major strain on the heart.

Combining Red Bull with alcohol is similarly risky. A recent study in Brazil found that college students didn't perceive themselves to be as intoxicated as they really were. The study indicated that drinking alcohol and Red Bull together significantly reduces the perception of headache, weakness, dry mouth and impairment of motor coordination.

Bull for a frantic generation

Red Bull has always maintained that its product is entirely safe. The company points to the fact that its drink is widely consumed and no published research has ever shown any link between harmful effects and Red Bull – on its own or with alcohol. This is accurate, but not entirely truthful. No studies have been conducted that might properly examine the potential adverse effects of regularly drinking Red Bull. So while the company can say there are no data, gullible guzzlers should not assume that the absence of data justifies a claim of no adverse effects.

The prospect of energy in a can is seductive and such is the desire of so many people today to feel some sort of buzz, that each year, people in 100 countries guzzle around two billion cans of this sugary brew. It's probably still most popular in clubs and bars, where tired dancers believe that mixing it with vodka will help them party the night away. But it can also be spotted in the hands of feckless teenagers and sleepy commuters on their way to school or work – a sad image far removed from the performance-enhanced athletes whom Red Bull regularly sponsors.

Red Bull may be a sales phenomenon but it is also a sad metaphor for a generation that is dead on its feet. In a society this energy-poor, maybe it's time to stop reaching for the blue and silver can, and reach instead for a lifestyle that doesn't demand us to be 24/7 automatons and that sustains, rather than drains, our essential vitality.

ACTIVE INGREDIENTS

Carbonated water, Sucrose, Glucose, Acidity regulator (Sodium citrates), Taurine, Glucuronolactone, Caffeine, Inositol, Vitamins (Niacin, Pantothenic acid, B6, B12), Flavourings, Colours (Caramel, Riboflavin)

SUCROSE, GLUCOSE – Carbohydrates

Sucrose and glucose are simple sugars. They are metabolised quickly by the body and produce a quick energy burst, followed by a deep energy deficit. High intake of sugar raises blood fat levels and leeches essential minerals such as copper, chromium and zinc from the body, leading to deficiency diseases, immune system impairment and even insulin resistance.

TAURINE – Amino acid

No human studies have examined chronic toxicity associated with long-term intake of taurine. In animals it can produce a decrease in body weight (a sign of toxicity) and dehydration. In rats and guinea pigs, high intake is associated with liver dysfunction. Other evidence suggests that even relatively small doses of taurine can enhance the toxicity of industrial pollutants such as carbon tetrachloride.

GLUCURONOLACTONE – Carbohydrate

A naturally occurring substance manufactured by the human body. There is a paucity of research on its effects, and what there is has been conducted largely on rats. Here's the problem. Rats metabolise this substance differently from humans and other mammals. No mammalian studies of glucuronolactone have been conducted, so its usefulness, and possible adverse effects, remain a mystery.

CAFFEINE – Stimulant

Increases heart rate and blood pressure and raises the level of harmful stress hormones in the bloodstream. In high doses, caffeine is dehydrating, addictive, and can reduce adrenal function and the body's immune response. In pregnant women, high caffeine intake is associated with increased risk of miscarriage.

FLAVOURINGS – Adds flavour

Synthetic flavourings can be a mixes of several industrial chemicals. They are essentially the same chemicals as perfumes and can thus be considered to be neurotoxins, allergens and potential carcinogens.

CARAMEL – Adds colour

Caramel produced by ammonia process is a common food colouring. This type of colouring has been associated with blood toxicity in rats. There is evidence that it may damage genes, slow growth, cause enlargement of the intestines and kidneys, destroy vitamin B and cause hyperactivity.

The Exchange is Dead, Long Live the Social Stock Market

Instead of a greed-led global arena, we need a place to raise finance for social enterprises

BY NICK ROBINS

It's quiet now at Exchange Alley in the City of London, a dingy little backwater near Bank underground station. But 300 years ago, this was the place where eager brokers and jobbers gathered to gulp coffee and swap share tips, before the London Stock Exchange (LSE) was formally established in 1773. Yet, if it's not careful, it could soon be game over for the Stock Exchange itself. Although it has just managed to fend off the latest in a series of takeover assaults – this time from New York's technology market, NASDAQ – the raiders will be back. More disturbing perhaps than the impending surrender of its autonomy, however, is the loss of its very reason for being, caught in a pincer of technological erosion and growing doubts over its social purpose.

To understand the current predicament, we need to go back two decades to the 1986 'Big Bang', when the 18th-century culture of 'my word is my bond' was swept away in an avalanche of deregulation. Mrs Thatcher's free market crusade targeted not only socialist bastions such as the miners, but also wanted to liberate enclaves of restrictive practices in the establishment – and none was more prominent than the City. Eager to avoid a court case with the Office of Fair Trading (OFT), the Stock Exchange agreed to open itself up to competition.

Four years later, it decided to shake off its old mutual ownership model and trade its shares on its own market, becoming just another 'bubble on the whirlpool of speculation', to quote economist John Maynard Keynes. This decision more than anything sealed the LSE's fate, and was followed in quick succession by five takeover bids from foreign suitors eager to get their hands on the extraordinarily lucrative London exchange. The combination of a traditional monopoly in the UK and its attractiveness as a location for foreign share listings – of everything from Chinese biofuel firms to mining groups from the 'stans – gives it an eye-watering profit margin of some 50 per cent.

The government and City have declared themselves neutral at the outcome of the Exchange's bidding wars. The current excuse for inaction quotes the 'Wimbledon Effect', arguing that, like the tennis championship, London's financial markets thrive despite being dominated by foreigners. This fails to recognise that while Britain continues to play financial tennis, the rest of the world is playing economic rollerball, where domination not fair play is the name of the game. No-one should miss the snobbish culture of pre-Big Bang London. But in place of a market characterised by a diversity of small, local, focused firms, we now have a globalised arena dominated by a few foreign-owned investment banks with a finger in every pie, and a potential conflict of interest in every deal.

> "While Britain continues to play financial tennis, the rest of the world is playing economic rollerball"

For many, high finance high jinks might seem remote from their daily lives or the planet's fate. But it's in the City, centred on the Stock Exchange, that the pace and direction of a large part of the global economy is decided. And at present, these resources are being traded ever faster in ever more blinkered and opaque financing structures. The Big Bang may have made London more technically efficient but, since 1986, the average time an investor holds a share on the LSE has shrunk from nine years to less than 12 months. As the world struggles to come to terms with the millennia-long consequences of profligate fossil fuel consumption, the place where society's savings are allocated for productive investment cannot think longer than the time it takes for a single orbit of the sun. The bitter irony is that the Exchange's destiny is now in the hands of the most myopic of all investors, a range of American hedge funds which hold 25 per cent of its shares.

Whatever ultimately happens in the battle for the LSE, massive expansions in computing power will combine with further EU-driven deregulation so that yet more trading will shift to the 'dark pools' of capital run by the investment banks, accelerating the downward spiral of short-termism. This disturbing prospect ought to focus minds on how the Exchange can be harnessed to provide capital for confronting climate change and closing the inequality gap.

Coincidentally, just as the Exchange was shoring up its defences against NASDAQ, a pioneering manifesto for a new type of capital market was launched in London. Bringing together some of the best minds in social finance, a report from the Charities Aid and New Economics foundations, entitled *Developing a Social Equity Capital Market* (www.neweconomics.org) asks how we can create a stock exchange where social enterprises can raise money without selling their soul. It's not as if there is a shortage of capital, with over £6 billion in socially responsible investment funds and nearly £50 billion in charity investments – which, one hopes, would be ready to back businesses that look beyond the next quarterly returns. There have also been highly successful private share-raisings of social enterprise companies, such as Café Direct and the Ethical Property Company.

What has been missing, however, is the trusted arena within which shares can be easily traded, while retaining an incentive for investors to stay for the long-run. Perhaps Exchange Alley can serve a new purpose, this time as the place where capital serves social as well as financial ends.

Nick Robins is the author of* The Corporation that Changed the World *(Pluto Press, £15.99)

Break from gradualism daily

The spiritual head of the Church of Stop Shopping returns with a one-off message of hope and despair

BY REVEREND BILLY

We are all activists, or we think we are. We have all searched for a theory of change. The apocalyptic Christians have their pillar of fire, war as a permanent weather system on their horizon. The liberals believe that change comes from some form of advertising, the industrial persuasion they call democracy. People who claim to be changing the world are constantly offering alternatives for our lives that encourage a strict gradualism.

Western leaders, from Bush to Bono – they all have an idea for change, but they fear sudden change like a Puritan fears the sexual act. Arnold Schwarzenegger committed one of his four Hummers to a stern diet of veggie fuel. Glamorous gradualism. But our more powerful partner is both Fabulous and Unknowable, and has no fear of suddenness. All activists are aware that we must take our strategies now from this more powerful partner in activism. Call it the Fabulous Unknown.

A friend of mine from The Theatre recently shouted to an entire restaurant, 'My art form hasn't changed the world since *Angels in America* in 1995! I'll start the North Pole Theatre. We'll go up there and… we'll raise our curtain on our play, perform until our stage melts, then we'll go down into the black freezing sea, and it will be a triumph!' I liked hearing this. She senses that now we must be extreme to be kind.

Each of us needs to shout, all night and into the next day, 'I want to change the world!' If we do this, maybe we can change ourselves enough to notice that the world is changing without us. The top-down enforcements coming from violent father-figures like Bush are no longer believed. The media networks are pirated and YouTubed into chaos. Right now, in this pixilated fog, amid this great lostness, there is an opportunity for greater boldness. A shout of EMERGENCY could go sideways through the rearranged acoustics of our new human media.

> "I'll start the North Pole Theatre. We'll perform until our stage melts, and then go down into the black freezing sea, and it will be a triumph!"

Am I being romantic? We have no choice. Most of our 'opportunity' comes from the realisation of 'necessity'. We've seen a drowning city. We've seen a drowning American city. What form should our activism take now? What's that voice I hear? This life system of which we are a part – it has a speaker who has taken the lead role… so intelligent and powerful and Unknown.

I'm writing this at a picnic table in Prospect Park, in Brooklyn, New York. Today is 6 January, and it is 70 degrees. The world is accelerating its change, and the gradualism of our boldest public figures looks like greenwashed preening, like Arnold with his Kennedys and Hummers.

Well, as American citizens in 2007, we know that our idea of boldness cannot come from public figures. James Brown is the exception that proves that paralysed rule. How to uproot that gradualism every day? Melt the stage. Yes, my friend's stage needs to melt. The ground moves. Makes our feet move, a dance we can't resist travels up our legs. We're sinking, we're flying…

The Fabulous Unknown vibrates us and we have to dance. These massive oak trees in the park are moving their branches in endlessly complex circles up there in the 70-degree wind, dancing but unsure of the meaning of the heat. This is the form the message takes now. It is the mix of joy and terror we feel in our bodies, and maybe someday it will be known information. Meanwhile, how do we talk to each other?

We dance and loudly pray – that's the play. We feel the responsibility to be the boldest thing on the stage, as we thought we were the lead actors, activists, Americans who dramatise democracy, human beings who create the future – all such things. But now we don't know our lines. Things are changing fast and, while we dance, we must listen for our instructions. Look over there: a polar bear swimming into the footlights.

Reverend Billy is the pseudonym of Bill Talen, actor, activist and author. He leads the Church of Stop Shopping, an activist performance group based in New York. His latest book, *What Would Jesus Buy?* (PublicAffairs, £7.99) comes out on 5 April.

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The CIS Solar Tower in Manchester, the UK's biggest solar project, will generate enough electricity every year to make 9 million cups of tea.

The government's recent announcement that the environment is to be put at the centre of children's education is welcome, if overdue news. However, there is a more fundamental problem with our schools that will take far longer to fix – the schools themselves. **By Matthew Carmichael**

When I opted to teach my sixth-form tutor group a lesson about global warming as part of their Citizenship studies, I discovered that almost all of them had gone through their compulsory education without being taught anything about the implications of what is arguably the greatest crisis in the history of civilisation. Those who had any understanding at all had gleaned it from home or from the television. The most they had been taught in school was some basic science about how greenhouse gases trap heat in the atmosphere. The seriousness of the consequences had not been covered, nor the implications for economic, political or home life, nor the timescales in which these changes might occur – which are of far greater relevance to them than to their teachers.

When I explained this to my pupils, some felt shocked at how little they'd learned about a subject that will have a profound impact on their lives, and suggested that the curriculum should be changed, so that Global Warming is explicitly taught in a way which is honest about its implications.

Of course, there were the usual sceptics who thought they knew better than the Intergovernmental Panel on Climate Change. At the age of 17, though, scepticism about what the authorities tell us should perhaps be welcomed, even if it is applied a little clumsily. Far more disturbing to me were the students who readily accepted that Global Warming is induced by human behaviour but went on to label simple measures, such as changing to low-energy light-bulbs, as 'extreme'. I realised that it is not just what we teach explicitly in schools that is the problem, but the insidious power of the messages that are taught implicitly. Both must be addressed as a matter of urgency if the worst consequences of global climate change are to stand a chance of being averted.

I hate it, I hate it, I hate it

Roundhay school in Leeds (pictured opposite) is an example of how resoundingly successful comprehensive education can be. Described by Ofsted as 'excellent', its pupils come from every possible social and racial background. Its examination results are among the best in England, and local estate agents estimate that parents moving into its catchment area add around £10K of value to local properties. I am very proud to teach English and Drama there, and would be very keen to send my own children there. It boasts brand-new buildings that replaced the old ones in 2003, under the Private Finance Initiative (PFI), and the site is now run by Aqumen, a subsidiary of Mowlem, the company that built the new school.

So if you want to know what a New Labour flagship school has to offer, Roundhay is a good place to find out. It does what this government wants schools to do, and it does it particularly well. In September 2005, one of Labour's most ambitious ministers, David Miliband (now Secretary of State for Environment, Food and Rural Affairs), chose the school as the location for an important speech. And what does a school like this teach a child about the environment?

'Painted breeze blocks, orderly and dreary, display the scars of toil that builders had to overcome. Their tiredness ebbs from the bricks into the classroom's atmosphere,

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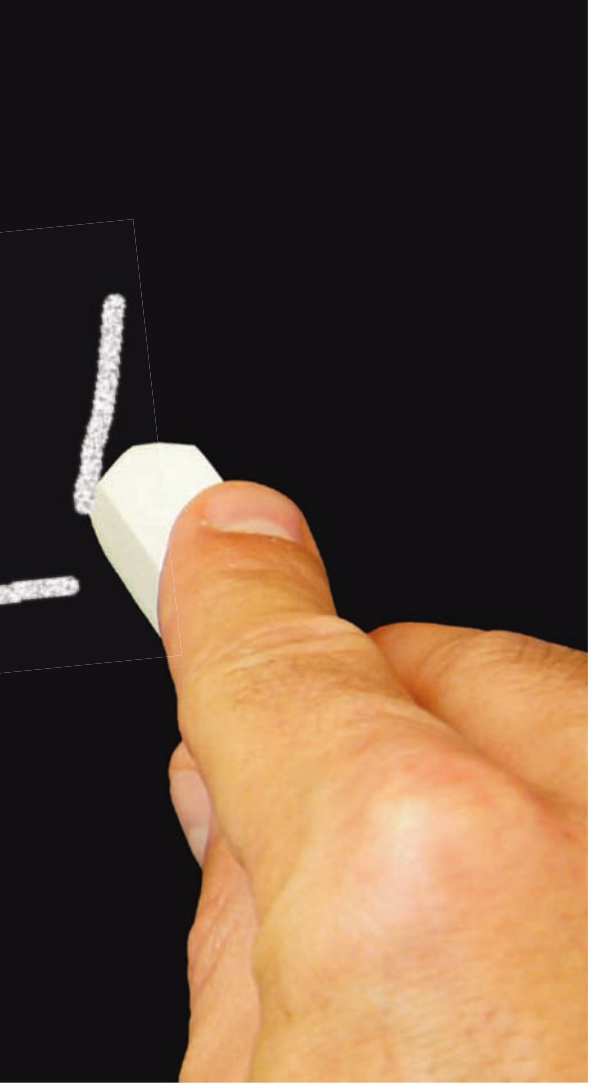

to be breathed in by teenagers, increasing their apathy and lack of enthusiasm.'

'The room I'm in is boring. I hate it. The room I'm in is modern. I hate it. The room I'm in is generic. I hate it, I hate it, I hate it. The room I'm in gives me no inspiration – it has no life.'

These words were written by students in my GCSE English class who were asked to answer a question from a past paper: 'Describe the room you are in'.

The windows are teachers

When School Works conducted an online poll of more than 1,000 teenagers, it found that 62 per cent of respondents didn't like their school building. So it should be good news that the government plans to spend £2.2bn on rebuilding, remodelling or refurbishing 180 schools in the next 15 years.

It should be, but Tony Blair's favourite 'legacy' project, the Building Schools for the Future (BSF) initiative, is a replacement for the PFI under which Roundhay was rebuilt. The government's £2.2bn will be matched by £3.3bn of private investment, with the aim that 'every child will be educated in a 21st-century environment within 15 years' – according to the website for 10 Downing Street (www.number10.gov.uk).

As for the 37 per cent of pupils who liked their classrooms, School Works found from their descriptions that a good classroom is 'bright, light, airy and clean'.

This is almost the exact opposite of a typical Roundhay PFI-built classroom. From the outside, the most striking thing about Roundhay is how tiny the windows are. My teaching room requires artificial light all the time except in very bright sunlight. It is impossible to ventilate the rooms by opening the windows, so all staff have been issued with fans, running at 40W, in order to circulate air (something which is absolutely essential when you spend an hour in a room crowded with 33 year-ten pupils, half of whom are boys – many teachers also use plug-in air fresheners). As for cleanliness, litter is a serious problem at Roundhay. A colony of seagulls live on the food dropped in the playground, and carpets are permanently pocked with trodden-in gum.

These problems may be trivial compared with schools that endure Portacabins or buildings that are falling apart, and I for one am grateful to be teaching in the new building rather than the old one. But if £5.5 billion, much of it taxpayers' money, is to be invested, it matters that we get it right. The windows and walls are silent teachers that, judging by the descriptions of my GCSE class, have sent the wrong message to pupils at Roundhay.

Where do waste-dropping children learn their attitudes to their environment? Perhaps from adults who pollute everyone's air with the waste products of wasted energy. Energy in schools is expensive. Leeds City Council spends £5.5 million per year – 38 per cent of its entire energy budget – on powering schools.

According to Peter Hambly, director of marketing and communications at the Carbon Trust, the average secondary school energy budget has doubled in the past three years to around £75,000 per year because of rising fuel prices. At Roundhay, apart from the lights, which switch off automatically when no-one is in the room, the signs of energy waste are everywhere. A quick walk around the school reveals fans and coolers left on in empty, sealed rooms; teachers wearing short sleeves in the middle of winter in overheated rooms; smartboards and computer monitors left on overnight; pressure taps in the toilets, which cannot supply less than 1.8 litres at a time; and a full car park. Only two out of a staff of more than 200 cycle to work, and a handful walk. The silent lessons being inculcated do not need to be spelled out.

Energy monitors

There are some environmentally responsible schools dotted around the country – such as St Francis of Assisi Academy in Liverpool and the Small School in Devon – though these are anything but typical. How is such expertise to be spread? The Carbon Trust is currently running a project to advise schools on how to be more energy-efficient. It offers a full energy survey, free of charge, to any school with an energy budget of more than £50,000 per year.

To change attitudes, says Peter Hambly, 'the ▶

ENERGY MONITORS

The Small School, Devon

- The Small School was founded by *Resurgence* magazine editor Satish Kumar in 1982. It has 35 pupils. It is now part of an umbrella organisation, Movement for Education on a Human Scale, which consists of six schools.
- The curriculum is split into three parts:

1) Academic - Science, Maths, English and French

2) Arts, Culture and Humanities

3) Ecological and Environmental.

- Aside from this, the pupils learn about three of life's essential needs: Food, Clothing and Housing.
- **Food:** Children are taught to grow, cook and serve food. They are taught to clean up the dishes and have respect for nature and food they grow and prepare. The school also raises funds through the food it prepares by holding dinners.
- **Clothing:** Children are taught everything about clothes, from spinning and weaving to sewing and mending.
- **Housing:** Children are taught to lay foundations, build roofs, plumbing and electrical wiring.
- Payment can be given through a monetary donation or through voluntary help within the school or even through donation of materials and produce.

way to approach it is to sell it as a financial saving. Staff respond to the idea of saving money, which could be spent on text books and equipment.' Recommended measures range from improving insulation and using Combined Heat and Power, to ideas that directly involve pupils. 'You can appoint an energy monitor in every class to be responsible for turning off computers, lights and so on,' suggests Hambly.

One such example, Copthall School in North London, is saving £36,000 over three years and reducing its carbon emissions by 90 tonnes. Head teacher Jane Beaumont says, 'It's been a really good way to involve students in thinking about how to reduce their impact on the environment.'

This is a promising approach for the vast majority of schools, especially if the hundreds that have requested the survey heed Peter Hambly's advice to 'cut emissions, and keep on cutting them.' However, a vast amount of money is about to be spent on renewing the building stock. These buildings will last for generations. Will the BSF buildings be any better than their PFI predecessors?

> Nearly all schools built since 2001 fail to tackle basic issues of environmental sustainability, such as providing natural daylight

The Bishop of Liverpool, Revd James Stuart Jones, recently asked the House of Lords what ecological principles lay behind the BSF programme. Lord Adonis' reply referred only to a mandatory environmental assessment. What use is an assessment if it can be ignored? The truth of the situation is that there are no known plans to replace Charles Clarke's 'Education (School Premises) Regulations 1999' legislation with anything more binding. The Regulations contain no requirements at all regarding efficiency for lighting, heating or water.

Profit or planet?

This means that it is left entirely to the school to demand higher standards in the designs, which is asking a lot. The Commission for Architecture and the Built Environment (CABE) says that half of the schools built since 2001 have been completed only to a poor or mediocre standard and that nearly all failed to tackle basic issues of environmental sustainability, such as providing natural daylight and ventilation. The reasons they give are all fundamental to the nature of Public-Private Partnerships. The Number 10 website – which makes no mention of energy efficiency – explains that 'Partnerships for schools will work with LEAs… to select a private sector partner… to construct, maintain and operate' new facilities.

However, according to CABE's director of campaigns and education, Matt Bell, local education authorities (LEAs) are inexperienced at dealing with private companies, and frequently do not get what they want. Contractors use the fact that LEAs are under severe time pressure (what happens when 2,000 pupils have no school to go to?) to squeeze out valued design elements. When it comes to evaluating the success of a job, speed and cost are all that count.

Norfolk's first Green Party councillor, Andrew Boswell, says, 'With PFI, the problem is, once again, that the private companies involved are seeking only to maximise their short-term profits. Renewable energy design is cut from their developments to provide immediate gratification for shareholders.' So even where local LEAs and heads do care about energy efficiency, they may not be able to get what they want.

What is urgently needed is the introduction of new regulations enforcing environmental standards commensurate with the scale of the global warming crisis. It is high time that such regulations were based on the long-term view of scientists and the interests of children, rather than the short-term view of politicians and the interests of shareholders. If the result is a sudden loss of interest in building schools on the part of the private sector, then real political leadership will be required to avoid a situation in which, not only are we committed to buildings each of which emit 100 tonnes more CO_2 than necessary every year for 50 or more years; but the opportunity is missed to demonstrate to an entire generation of pupils the true value of energy.

For schools such as Roundhay, which are already built, strict targets should be set for year-on-year cuts to emissions. This would save money, set a constructive example to

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children, and prevent energy-rich, apparent 'solutions' to global warming – such as air conditioning – from catching on.

A 'State of Emergency' Curriculum

While the government's announcement is welcome news, it remains to be seen how far it will go. Through the National Curriculum, it has access to the minds of a generation. Simply by ensuring an honest account of the global scientific concensus, the curricula in Science, Geography, English and Citizenship could ensure that every single pupil is taught the issues.

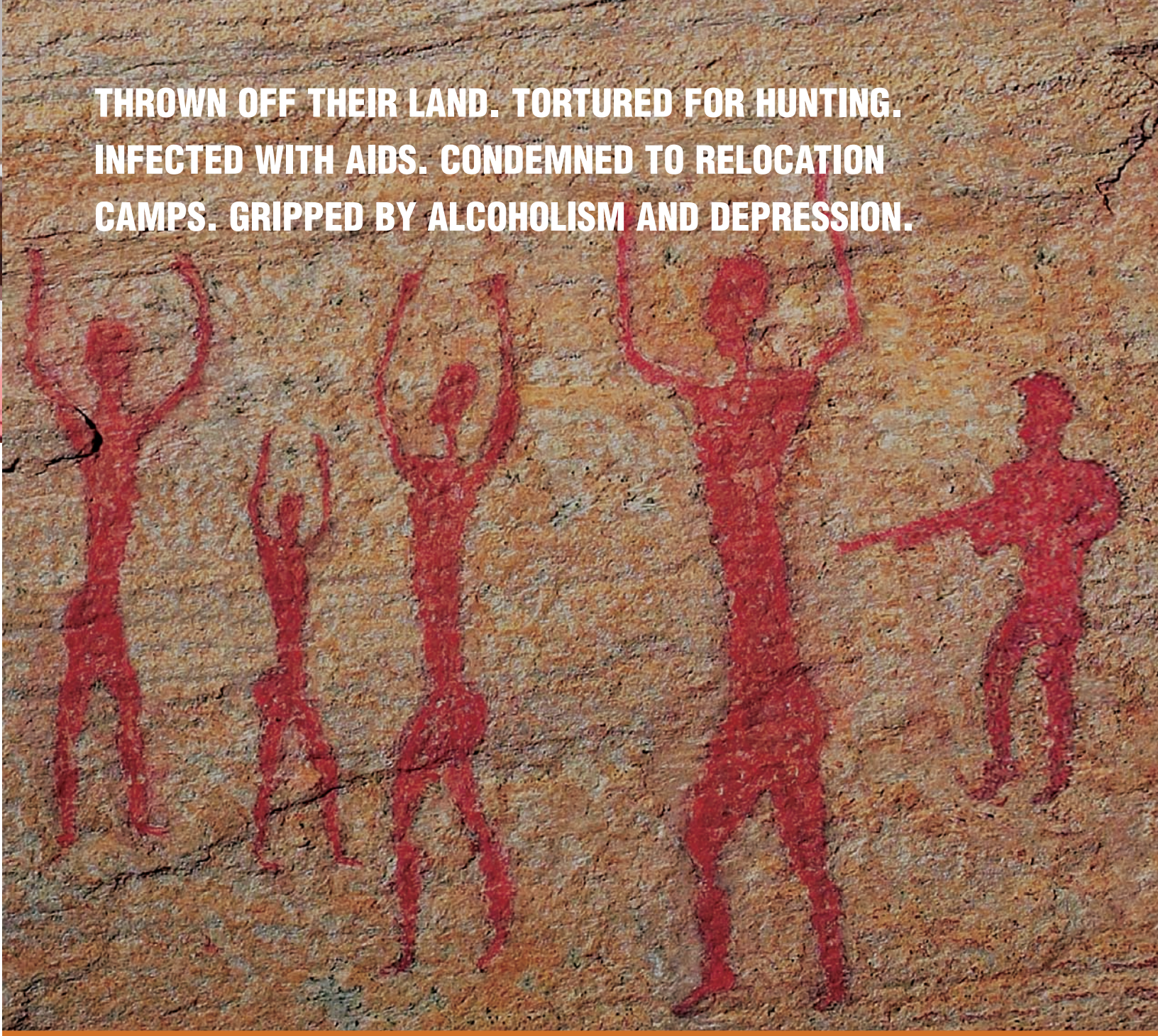
Environmental studies should be made a compulsory subject. The Qualifications and Curriculums Authority could be required to ensure that examinations in Media Studies, Politics, Economics and RE address the topic. Already setting an example, St Francis of Assisi Academy has made the environment central to every part of its curriculum.

Ofsted can be required to inspect schools using any criteria the government chooses; why not include environmental factors?

When a political or military crisis arises in any nation, unusually strict conditions are imposed under the banner of a 'State of Emergency'. Having sold the controls to many of the public services which could have made a difference, the National Curriculum is one tool the government has retained by which it could seriously tackle global warming. A 'State of Emergency' National Curriculum, adapted to the needs of a generation who face the potential for runaway global warming unless we act now, and given teeth by Ofsted, would not be a luxury. Rather, it would demonstrate genuine political leadership where it could not be more urgently needed. If we do not respond to the crisis of Global Warming with educational measures that reflect the scale of the threat, we will remain guilty of creating schools that do not do their fundamental job of preparing children for adult life. One of my GCSE English pupils had already detected as much when she wrote of her classroom: 'This is a place of blinkered open eyes, of knowledge shared by those who don't understand.'

The Small School: education on a human scale, where students learn about the environment

Matthew Carmichael is a teacher and freelance writer.



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- The Fund Manager George Latham is AA rated by Citywire.

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% Change over	1Yrs	3Yrs	10Yrs
Henderson Global Care Income Fund	+24.1	+67.7	+151.9
Sector Average	+17.9	+64.9	+138.3
Henderson outperformance	**+6.2**	**+2.8**	**+13.6**

Discrete Year Performance (%) as at 31 December 2006*

	Dec 06 Dec 05	Dec 05 Dec 04	Dec 04 Dec 03	Dec 03 Dec 02	Dec 02 Dec 01
Henderson Global Care Income Fund	+14.9	+16.7	+12.8	+17.2	-11.3

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BIOFUELS

In his final State of the Union address, George Bush announced his support for the adoption of biofuels on a massive scale. But is the plan such a good idea? By **Pat Thomas**

There is an old saying: If something sounds too good to be true, it probably is.

In the current scramble to face up to the realities of climate change and the current peak oil demand, pundits on both sides of the ecological debate have embraced the concept of biofuels – renewable fuels derived from vegetable matter – as an effective solution to the impending global crisis.

The theory seems simple enough. By burning plant-derived energy we are burning a carbon-neutral fuel, because the CO_2 released through combustion of plant fuels is equal to what the plant took out of the atmosphere in the first place.

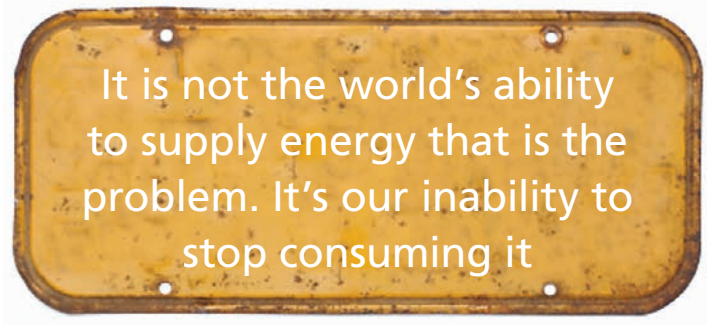
But the science is far from complete, the energy savings far from convincing and, although many see biofuels as a way to avoid the kind of resource wars currently raging in the Middle East and elsewhere, going down that road may in the end provoke a wider series of resource wars – this time over food, water and habitable land.

The scale of Bush's and others enthusiasm for biofuels, seems, once one knows the details, to make little sense. Except perhaps as one of the biggest global investment opportunities in decades.

Currently politicians, global food and fuel corporations and biotech companies are all vying for position. The pieces are shifting so radically and so quickly on the global chessboard that food multinationals like Unilever, fearful of a marketplace that pits food against fuel, now find themselves using words like 'deforestation' and 'sustainable farming' and rubbing shoulders with non-governmental organisations who have been so critical of them in the past.

To make the numbers work, the biofuels industry is being propped up by substantial discounts in fuel duties, tax breaks and subsidies, import bans and the government mandates to implement them. Without these, biofuels – particularly the first-generation biofuels, bioethanol and biodiesel – would never find their way to the forecourt.

Simply replacing our fossil fuels with biofuels, however, misses the point: it is not the world's ability to supply us with energy that is the problem, but our inability to know when to stop consuming. To solve this we need to look carefully at our total energy landscape: how we use our cars, how we heat our homes and how we design our houses, flats and public buildings, how we plan our communities, how and where we grow our food, the 'environmental footprints' of all the things we consume. Without attention to these details the energy crisis will only deepen.



In conceiving real solutions we need to be able to look to models of genuine sustainability – many of which exist on the local scale – rather than those that promote the illusion of sustainability at a national or global level. Brazil is a good example of this illusion. Biofuel enthusiasts often point to that country as a model for all that is good about the biofuel revolution. Yet Brazil is a troubled country.

Its sugar-cane industry is built on the back of slavery and low wages. It is now converting half of its sugar harvest into bioethanol and, while 40 per cent of Brazil's cars may be running on this fuel (the figures are not at all clear, since many ordinary people have switched back to petrol as the market price for bioethanol there has risen), the country's rich and diverse landscape is rapidly being ploughed under to make way for more plantations, which will produce more ethanol for home and export markets. These days, 80 per cent of Brazil's greenhouse gas emissions come not from cars but from deforestation.

In the articles that follow, *The Ecologist* examines the biofuels phenomenon from a range of different perspectives, including those of farmers, car manufacturers and conservationists. We tackle the myths that fuel the current fervour for biofuels, the GM agenda behind their promotion and propose simpler, smaller, more localised solutions that can make a difference to the energy crisis.

What is clear is that biofuels can only ever make a small-scale contribution to our energy demands. Jeffery Dukes, author of *Burning Buried Sunshine: the human consumption of ancient solar energy*, has calculated that, at current rates of use, we burn up four centuries' worth of fossilised animals and plants in the forms of oil, coal and gas. Without positive, even aggressive, efforts to reduce the world's overall use of energy, their contribution on a global scale will be too little and too late, and may even promote greater damage to the environment over the long term.

Conservation and moderation are a hard sell both to industry and the average 'consumer'. But it is clear that to avoid dealing with the politically unpopular need to reduce fossil fuel consumption, our leaders are throwing their weight behind expensive programmes involving alternative fuels that distort the marketplace and are unlikely to produce substantial benefits for decades, if in fact they produce any benefits at all.

Pat Thomas is* The Ecologist's *health editor

AGAINST THE GRAIN

Plant fuels can never meet our current and growing energy needs and, as **Robin Maynard** reports, adopting a 'carbohydrate economy' may prove disastrous for our farmers, our food supply and our future

Addressing the Conservative Party Conference in October 2006, the President of the National Farmers Union (NFU), Peter Kendall, was keen to impress upon delegates 'the key role' his members could play in tackling climate change. Referring to how the country's farmers kept Britain fed when imports were blocked by German U-Boats, Kendall declared: 'Not since the Second World War has our land, our farming and our farmers been so important as a resource.'

In particular, he banged the drum for the large-scale planting of biofuel crops – these being the familiar crops of oilseed rape, sugar-beet and wheat, but which, rather than being used as human or animal foodstuffs, would be processed into fuel, namely biodiesel or bioethanol.

In seeking to ally his members' interests to those of the newly carbon-conscious Conservatives, Kendall clearly sees an opportunity to revive the reputation and fortunes of UK farmers. For decades, UK farming has stood accused of all manner of ills – of producing surpluses that swallowed up vast subsidies from UK taxpayers; of then dumping these surpluses on world markets, undercutting prices and destroying the livelihoods of poor farmers in the developing world; and of all the while ploughing up wildflower-rich meadows, decimating insects and other wildlife through indiscriminate pesticide use, and polluting rivers and under ground aquifers with fertiliser run-off. More accurately and justly, these ills should be laid at the door of the industrial end of agriculture and the agribusinesses constantly pushing the agrochemicals, pharmaceuticals and farm machinery that fuel intensive farming. Indeed, during those decades, it's not just wildlife, but hundreds of thousands of family farmers and farm-workers who have also disappeared from our farmland.

> 'Not since the Second World War has our land and our farmers been so important as a resource'

What a PR coup for the industrial farming lobby to now be seen as the good guys, making common cause with environmentalists to tackle climate change through the growing of 'green' energy crops. Farmers across the world who have seen the prices they receive for producing their crops fall relative to the costs of growing them, would have a new, booming market and they would be valued for producing something everybody needs: energy. Meanwhile, processors of crops for food oils and other industrial uses would gain a bigger, competitive market for their outputs. For local politicians, more crushing and refining plants equals more jobs.

Vested interests

Whatever the NFU's vested interest in pushing biofuels, the policy framework coming from the European Commission and UK government seems modest and reasonable. The EU Directive 'on the promotion of biofuels or other renewable fuels for transport' sets a target for member states to achieve a substitution of petrol and diesel with biofuels of 5.75 per cent by 2010, with an estimated maximum of around 10 per cent by 2015.

Yet even meeting these targets will be near impossible, and indeed many member states, Britain among them, are already falling behind. Figures from the Organisation for Economic Co-operation and Development (OECD) show that Europe would need to convert more than 70 per cent of its total arable land to raise the proportion of biofuel currently used in road transport to a mere 10 per cent.

In the UK, we currently use 37.6 million tonnes of petroleum products annually. To replace that with biodiesel from oilseed rape would require 25.9 million hectares of land – which is not only four and half times greater than our total current area of arable land (on which the first-generation biofuel crops of oilseed rape, sugar-beet and wheat would be grown), but also greater than the entire area of agricultural land in the UK (18.5 million hectares).

The story is the same in the USA. Despite turning 55 million tons of maize into bioethanol, equivalent to one-sixth of the entire US corn harvest, this distils down to only enough biofuel to substitute for three per cent or current oil and diesel used in road transport.

The rich countries of Europe and the USA are also looking further afield in pursuit of the maximum economic gain. Malaysia and Indonesia have cleared huge swathes of rainforest – one of the world's most

It takes one sixth of the US corn harvest to power just three per cent of its transport diesel

valuable resources for natural carbon-storage and biodiversity – to plant oil palms for biofuel production. 'The demand for biofuel will come from the EU,' Malaysian newspapers confidently report. The country now has over 30 refineries for producing biofuel from palm oil, including joint ventures with European-based companies, such as Dutch producers Biox, which have set up just across the North Sea in Rotterdam.

Friends of the Earth's 2005 report, *The Oil for Ape Scandal – How palm oil is threatening the orang-utan*, catalogues the environmental and human costs of the global biofuel market:

'Indonesia has one of the highest rates of tropical forest loss in the world, and illegal logging is rife. The island of Borneo, divided between Indonesia and Malaysia, has lost half its forest cover, while the smaller Indonesian island of Sumatra has lost more than 70 per cent. In Indonesia, the rate of deforestation has increased to two million hectares each year, an area of forest the size

The extinction of the orang-utan due to the destruction of its Indonesian habitat could be one of the unintended consequences of the biofuels revolution

The benefits of organic farming

A study by the UK Ministry of Agriculture in 2000 suggested that organic farming required 50 per cent less energy overall than intensive non-organic agriculture. Organic arable production was about 35 per cent more energy-efficient, with organic dairy farming rising to 74 per cent more efficient. More recently, a more detailed Life Cycle Analysis of ten organic and non-organic sectors, published in 2006 by the Department for Environment, Food and Rural Affairs (Defra), shows that on average, organic farming reduces energy use by 15 per cent, with typical lower energy use of 30 per cent less. These energy savings are delivered by avoiding the use of nitrogen fertilisers, relying instead on crop rotations, livestock manures, and organic farming's own natural 'wonder' ingredient of clover, which boosts fertility by naturally 'fixing' nitrogen from the atmosphere.

Because organic crops don't have readily-available nitrogen in the form of soluble fertiliser, they produce more extensive root systems, increasing organic matter in the soil. The Rodale Institute, in the USA, found that organically managed soils typically contained between 15-28 per cent more soil carbon than non-organic soils. If organic farming was adopted nationally in the USA, the researchers estimated that the greater amounts of soil organic matter present would soak up between one to two per cent of total US carbon emissions.

Organic farmers are also three times more likely to be involved in local or direct marketing of their produce than non-organic farmers, according to a University of Exeter study. And in 2005, a study of more than 2,000 organic farm businesses found that nearly 50 per cent were involved in or considering selling their produce locally through farmers' markets, fruit and vegetable box schemes or farm shops. These reduce 'food miles' and thus CO_2 emissions, and even help to reduce the amount of imported organic produce: 66 per cent of organic produce that can be grown in the UK is now UK-sourced, compared to 30 per cent in 2002.

of Wales. A World Bank report has blamed commercial developments – especially oil-palm plantations – for the acceleration. In Malaysia, the development of oil-palm plantations was responsible for 87 per cent of deforestation between 1985 and 2000. The palm-oil industry has set up 6.5 million hectares of oil-palm plantations across Sumatra and Borneo, but the destruction extends to over 10 million hectares of rainforest. By 2020, Indonesia's oil-palm plantations are projected to triple in size to 16.5 million hectares – an area the size of England and Wales combined.'

Oil-palm plantations are estimated to be responsible for at least half of the observed loss of orang-utan habitat between 1992 and 2003. Furthermore, acording to Friends of the Earth, plantations are often forcibly established on land traditionally owned by indigenous peoples. In Indonesia, between 1998 and 2002 alone, 479 people were reported as having been tortured in conflicts defending community rights, and dozens of people have been killed in land-tenure disputes. No wonder rainforest campaigners call biofuel made from oil palm, 'deforestation diesel'.

On the other side of the world, Brazil, the world's largest sugar producer and exporter, is also far down the route of converting cropland and rainforest to biofuel production. Half of Brazil's sugar cane harvest goes to make bioethanol; while the ever-expanding area of soya-bean plantings, already a leading cause of rainforest destruction in the Brazilian Amazon, is being diverted to fuel production. According to Greenpeace, an estimated 1.2 million hectares of what used to be rainforest have already – mostly illegally – been destroyed to grow soya beans.

Oil-palm plantations are often forcibly established on land traditionally owned by indigenous peoples. Methods include torture and killing

Going bust

Norfolk may seem a long way from Borneo and Brazil, but by joining the global rush to grow large-scale biofuel crops, UK farmers will, like any commodity producer, have to compete at world market prices; and the entry of another group of biofuel producers will only accelerate the intensity of that global market. A few huge-scale UK biofuel barons might be able to compete, but it's doubtful they will be that profitable, given that oil palm produces four times the biodiesel per hectare of oilseed rape, and is grown in countries where labour and life are cheap, and environmental restrictions limited or ignored.

From the UK to Indonesia, farmers will be forced into ever more cut-throat competition, forcing down prices and causing ever greater rainforest clearance as Indonesian and Malaysian producers scale up to cut costs. Indigenous peoples, orang-utans and a fair number of UK farmers will be tossed into the flames of that brutal competition. US soya-bean farmers felt the heat last year: despite winning a tax break from the government for growing soya beans for fuel, their prices were undercut just three months later when more than a quarter of a million gallons of biodiesel made from Ecuadorian palm oil was imported.

Far from improving fuel and food security biofuel production have remained hidden from public view.

Corn causes one of the highest rates of soil loss of all major US crops. The Natural Resources Conservation Service estimates that soil erosion rates in America's main

The enviromental crop?

Biodiesel enthusiasts claim that oilseed rape produces two to four times the amount of energy needed to grow and process it. However, when the impacts of using nitrogen fertiliser to grow the crops are included, the claimed energy gains evaporate.

Nitrogen fertilisers are already accepted to be the largest source of carbon dioxide (CO_2 – the main climate change gas) produced by agriculture. Large amounts of natural gas and oil are used in their manufacture – with nearly seven kilograms of CO_2 being given off for every kilograms of nitrogen fertiliser made. A recent study for Defra by Sheffield Hallam University, which exhaustively evaluated the potential climate change benefits of biodiesel against other measures, found that 'the most significant contribution to total greenhouse gas emissions from the production of biodiesel from oilseed rape in the UK is due to nitrogen fertiliser.'

Adding fertiliser back into the calculations, the researchers concluded that the amount of CO_2 saved, in comparison to fossil-fuel derived diesel, was reduced by more than 60 per cent – negating any significant climate change benefits.

For comparison, the Sheffield Hallam University study also calculated the net CO_2 saving and cost-effectiveness of a range of other, simpler options. Biodiesel from oilseed rape came out as the least cost-effective measure for reducing CO_2 emissions other than that of compressing natural gas (which increases its burning efficiency). Fitting homes with glass-fibre loft insulation was the most cost-effective measure, cutting 500kg of CO_2 for every £ spent. Replacing an old gas-heating boiler with a new, condensing boiler reduced emissions by 35kg of CO_2 per £. In contrast, biodiesel delivered cuts of a mere 5kg of CO_2 or less, for each £ invested.

Losing ground

While the political and commercial focus has concentrated almost exclusively on the alleged CO_2 savings of biofuels, the environmentally-damaging aspects of

Barbara Young: warning the farmers

THE ENVIRONMENT AGENCY

Corn causes one of the highest rates of soil loss of all major US crops. The Natural Resources Conservation Service estimates that soil erosion rates in America's main

at home or overseas, any massive planting of biofuel crops will further erode it. As oil becomes more expensive to extract, and the consequences of using it more damaging to our environment, we will need to reduce our reliance on long-distance, oil-hungry food imports and use our own farmland to feed people, not cars.

The European Commission by setting a 5.75 per cent target for biodiesel as part of the overall fuel mix and paying farmers an extra 45 Euros a hectare to grow them is encouraging the increased release of greenhouse gases due to the vast inputs of fossil-fuel-derived fertilisers used to grow them. The UK government has compounded this environmental idiocy by cutting fuel duty on biodiesel by 20p a litre. Far from supporting a 'green energy crop', they are, in effect, exacerbating climate change by stealthily subsidising the use of fossil fuels.

New markets for old crops

We have to stop seeing biofuel crops as a new solution, and rather as old commodity crops in search of new markets. The two main biofuel crops promoted in the UK are oilseed rape and sugar-beet. As a source of human foodstuffs, oilseed rape has seen some decline in market demand as food processors and consumers take nutritionists' advice to avoid the hydrogenated fats that oilseed rape is used to produce.

The once booming sugar-beet industry has been a political sacrifice to the hugely popular 'Make Poverty History' campaign. The protected quotas for making white sugar inefficiently from a root vegetable grown in the temperate UK, have been stripped away

'Some of these biofuels are pretty heavy on water. Some of them do dreadful things to the soil. All we are saying is let's make sure we are actually producing something that is more environmentally sound and doesn't have environmental downsides.'

Barbara Young, Chief Executive, Environment Agency

corn-producing states are five times the acceptable level. With erosion and run-off of soils come attached particles of pesticides and fertiliser, making their way into watercourses, streams, rivers and lakes.

In the early 1990s, the USA was losing three billion tonnes of topsoil annually, bringing off-farm costs to the nation – from unblocking drains, clearing roads and treating water – of $3.1 billion per annum. In the UK, too, corn is associated with appalling soil losses, as the crop is harvested late in the year, when rain and the use of heavy machinery combine to lead to major erosion problems. The last major soil survey showed that 44 per cent of the country's arable land was at risk.

In the USA, land set aside for conservation purposes was brought into use to reduce this erosion, in the UK it was used simply to reduce EU surpluses. Biofuels can already be grown on set-aside land in the UK, and no doubt as fuel demand increases in the UK and US, soil conservation may be deprioritised.

Moreover, both growing and processing biofuels requires significant amounts of water – a factor that is not currently taken into account in most energy-in/energy-out calculations. As Barbara Young, Chief Executive of the Environment Agency, commented in the journal *Farmer's Weekly* in October 2006:

'Some of these biofuels are pretty heavy on water. Some of them do dreadful things to the soil. Some of them, unless they are very close to a processor, create more carbon dioxide by transportation than they save by reducing fossil fuels. All we are saying is, let's do the life cycle analysis to make sure that we are actually producing something that is more environmentally sound and doesn't have environmental downsides.'

Her comments were a further reflection on her earlier criticism of the promotion of biofuel crops as green crops, in which she opined that too little thought had gone into the NFU's pro-biofuels campaign and that the organisation had, as she put it bluntly, 'Got it wrong every bloody time!'

as one of the concessions to bring greater trade justice to southern producers, who can grow sugar-cane far more cost-effectively.

The main processor for that now redundant sugar-beet, British Sugar, has, along with the NFU, been pushing for greater support for biofuels. In desperation at the closing of one market and anticipation of the opening of another, British Sugar is building a £20 million processing plant at Wissington, Suffolk for turning 100,000 tonnes of sugar-beet and wheat into bioethanol.

This may be good news for the East Anglian sugar-beet barons and the Caribbean sugar-cane farmers, no longer having to compete against subsidised white sugar on the global market, but the enterprise has more to do with saving British Sugar's business than the planet.

In a crisp critique of the East of England Development Agency's support for a UK bioethanol programme comprising 12 such processing plants, Sue Pollard of the Green Party noted that just one plant, processing 100,000 tonnes of sugar-beet and wheat annually, would require 35,000 hectares of cropland to supply. Given the spread of suitable arable land, this would have to be brought in from a catchment area of more than 24,000 square kilometres, by HGV lorries totting up three million miles annually, and belching out 36,000 tonnes of CO_2 in the process.

Feeding cars, not people

To date, the USA has provided 70 per cent of the world's grain exports. Now, countries dependent on US wheat and maize are getting nervous. Lester Brown of the US Earth Policy Institute gives a grim prediction: 'Simply put, the stage is being set for a head-on collision between the world's 800 million affluent automobile owners and food consumers.'

It may sound like far-fetched scaremongering to suggest that there could be a real conflict between the growing of crops to feed people and for fuel to feed cars. But the situation in other countries, far down the road in turning over their agricultural and previously uncultivated land to growing biofuel crops, suggests otherwise. 'Cars, not people, will claim most of the increase in world grain consumption this year,' ran a headline on *The Daily Telegraph*'s website, covering the US Department of Agriculture's projection that of the extra 20 million tons of wheat grown globally in 2006, 14 million tons would go to producing bioethanol for use in American cars, with the remaining six million tons left to feed the world's growing numbers of hungry people.

Bioethanol plants for turning wheat and corn into fuel are being constructed across the US corn belt at an amazing rate, with 55 built or planned in Iowa alone. Over 50 per cent of all corn grown in South Dakota, one of the top 10 growing States, is already being diverted into making fuel for cars. This trend is worrying US livestock producers and food processors. That might be beneficial if it forced factory-farms to shift to more extensive, natural grazing systems and food and drink processors to rely less on corn-syrup and other food and drink bulking additives.

But it's not just animal feed-lot and big food businesses that are feeling the pinch. As the price of corn and wheat rises due to increased competition between the US fuel and food markets, staple foods like bread become more expensive and less grain is available for export and as food aid.

Most recently, the competition between food and fuel in the UK was heightened, with the announcement that the government would end subsidies for food production crops by 2020 and replace these with subsidies for what environment minister David Miliband called 'environmental security' – tackling global warming through the growing of energy crops, protecting the landscape and reducing methane emissions.

It makes no difference if large areas of our prime food producing land are turned over to fuel crops, compelling us to buy in food from the world market – or if home-grown food security is sustained while other countries, such as Africa, are encouraged to grow our fuel. Either way, relying more on imports of food or fuel is not sustainable and contradicts the objective of curbing the greenhouse-gas-generating food and fuel miles inherent in those imports.

This increased competition between food and fuel use coincides with world grain stocks standing at their lowest level, and at a time when world population growth brings 75 million more mouths to feed each year. The heat waves in 2006 reduced both US and European harvests. This, combined with existing low global grain stocks and the increasing demand for wheat and maize for biofuel production, caused prices to rocket. With wheat prices now hitting a 10-year high, millers are predicting a knock-on hike in the cost of a loaf of bread.

Today, only in wealthy countries can most consumers afford to feed both themselves and their cars. Yet in the face of global climate change, it will become increasingly difficult to avoid the choice between fuel or food even in the West. As we consider whether to fill our bellies or our motorways it's worth considering this: the grain needed to fill a typical SUV's 25-gallon tank with bioethanol would feed one person for a year.

Robin Maynard was co-ordinator of the family farming body, FARM and is currently Head of Communications for the Soil Association. This article is written in a personal capacity.

As we consider whether to fill bellies or motorways, it's worth considering that the grain needed to fill up a typical SUV's tank would feed one person for an entire year

Forests or Fuel?

The world's forests are natural carbon 'sinks' that remove and store atmospheric CO_2. So why, in the name of saving the earth, asks **Renton Righelato**, are we cutting down these precious resources to make way for fuel crops?

Most analyses of the benefits of biofuels focus chiefly on the crop/fuel cycle, ignoring the value of long-term carbon 'sinks' such as forests and grasslands. Yet, to be comprehensive, our approach to climate change must also look at the alternative of maintaining or restoring these areas, compared to destroying them and turning them over to arable production of fuel crops.

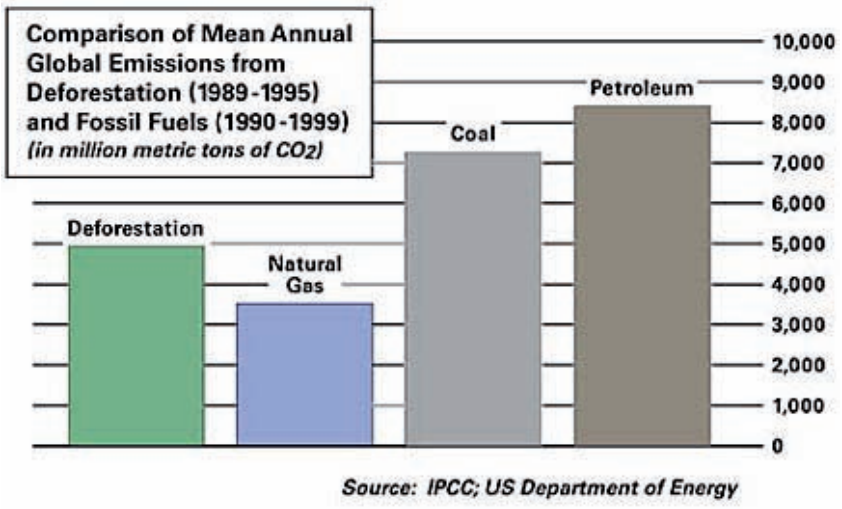
When arable land is restored to forest instead of using it for biofuel production, carbon stores build up in the soil and vegetation and outweigh the emissions avoided by the production of biofuel (see illustration). Converting cropland to tropical forest can sequester 20-30 tonnes CO_2/hectare per year – two- to threefold higher than the emissions avoided by sugarcane-derived bioethanol. In temperate regions, forest regrowth is slower but the rates of carbon sequestration are still two- to threefold higher than the avoided emissions from biofuels produced from temperate crops. The sequestration rates fall as forests mature, but only after 50 to 100 years might the cumulative avoided emissions exceed the carbon sequestered by forest restoration.

Where, directly or indirectly, natural forests or grasslands are converted to arable land to permit the production of a fuel crop, the loss of carbon stored in the biosphere must be factored in. In the tropics, the amount of carbon released into the atmosphere in conversion of secondary forest to burnt cropland is approximately 600 tonnes of carbon per hectare; the conversion of primary and logged forest releases approximately 700 tonnes carbon per hectare. Most of this loss occurs through burning and biodegradation in the months following the initial clearance, and its impact on global CO_2 and warming is immediate.

Balancing this amount of carbon in the atmosphere with the emissions avoided through the use of biofuels would take 30 to 50 years. Furthermore, removal of forest cover to make way for biofuel crops may reduce downwind rainfall, causing a cascade of further forest loss, further reducing the biosphere's capacity to sequester carbon and accelerating warming.

Replacing diverse natural habitats with monocultures of arable crops drastically reduces the range of plants and animals that an area supports. This is particularly true in the tropics, where the forests are the most biologically diverse regions on the planet and where forest loss has already eliminated or endangered many species. Intensive agriculture also reduces amenity value: there is less countryside for people.

The next few decades are a window of opportunity for us to develop real low carbon societies. In this window, to minimise the net flux of carbon dioxide to the atmosphere, it is clearly better to maintain existing forests and regenerate forest on available arable land, rather than to produce biofuels from arable crops. Compared with large-scale use of bioethanol and biodiesel, this will result in lower atmospheric carbon dioxide levels and it will provide a larger more effective carbon sink for the future.



Dr Renton Righelato is chair of the World Land Trust and a Visiting Research Fellow at the Environmental Systems Science Centre at the University of Reading

Biofuels – facts and fiction

The claims made for biofuels make it seem truly a wonder crop. **Mark Anslow** separates the wheat from the chaff

CLAIM 1 You get more out than you put in...

For more than 15 years, David Pimentel, Professor of Ecology and Agriculture at Cornell University in New York, and his colleague, Professor Tad Patzek at Berkeley, have published peer-reviewed research showing that biofuels give out less energy when burnt than was used in their manufacture.

By using a 'cradle-to-grave' approach – measuring all the energy inputs to the production of ethanol from the production of nitrogen fertiliser, through to the energy required to clean up the waste from bio-refineries – they have shown that while it takes 6,597 kilocalories of nonrenewable energy to produce a litre of ethanol from corn, that same litre contains only 5,130 kilocalories of energy – a 22 per cent loss.

Their work has been fiercely attacked by the biofuel lobby, who argue that Pimentel and Patzek include too many 'energy input' costs, and fail to give credit to the other, useful 'co-products' created in the process of refining biofuel.

Neither objection stands up under closer scrutiny. In fact, corn uses more herbicides, insecticides and fertiliser than any other crop; and 99 per cent of all cornfields used for producing bioethanol are heavily fertilised with nitrogen.

Pimentel and Patzek have shown that although the energy costs involved with fertiliser production have fallen, most of the factories producing nitrate fertiliser in the USA today were built in the 1960s and are highly inefficient. As such, they estimate that the energy costs of nitrogen fertiliser manufacture account for over 30 per cent of the total energy needed to grow corn. When the energy costs of labour, machinery, petrol and diesel, other fertilisers, herbicides, insecticides and corn seed production are figured into the equation, merely growing corn using intensive agriculture accounts for 38 per cent of the energy needed to produce a litre of ethanol.

To make their energy costs appear more favourable, proponents of biofuels frequently 'off-set' the energy value of other substances produced during the refining process against the total energy used to produce the fuel. For bioethanol, these co-products include animal feed and carbon dioxide gas. For biodiesel, they include animal feed and glycerine, a component of soap. They argue that, by calculating the energy that would have been required to produce these substances by themselves, the amount of energy accounted for in the biofuel production process can be reduced. In some studies, the energy value of co-products has been calculated at 150 per cent more than the energy required to produce the fuel.

But the energy and monetary value of these co-products is highly subjective. In the UK, the production of glycerine, which biodiesel producers had hoped to sell to cosmetics companies to offset the costs of production, has reached such levels that supply is exceeding demand. Some refiners have been forced to simply burn it. In the US, the value of the grains left over after ethanol distillation has been much touted as an animal feed. But research has shown that this grain contains less energy than normal animal feed (usually made from much less fertiliser-intensive soya), and that production of soya has not fallen as ethanol production has risen, indicating that livestock farmers have been reluctant to change the their animals' diet and use the new feed. David Morris, a biofuel lobbyist, has even admitted that it may benefit refiners more to burn the animal feed as fuel than to sell it.

Some ethanol distilleries have bottled the carbon dioxide that is given off during the fermentation process and sold it to carbonated drinks manufacturers, counting the value of the by-product against their overall energy costs. Most, however, have not.

Energy offset benefits can only be counted if the co-products are genuinely used in substitute for another product. Refining ethanol produces roughly equal parts ethanol, carbon dioxide and animal feed. Given that US corn-based ethanol production in 2005 peaked at 16.2 billion litres, this means that an almost equivalent amount of co-products (by volume) must have been produced. If these products are, as market figures suggest, unwanted, then instead of providing a useful 'offset', they are set to become a serious waste problem.

CLAIM 2 It makes economic sense

In 2006, the American government handed out between $5.1 and $6.8 billion in ethanol subsidies. These include payments made to farmers, tax breaks given to refiners and payments made under carbon reduction programmes. But instead of these subsidies finding their way into farmers' pockets, they are instead swelling the accounts of several large biofuel manufacturers.

One company, Archer Daniel Midlands (ADM, one of the world's largest agribusiness companies), accounted for nearly 28 per cent of the US ethanol industry in 2006.

According to attorney Arnold Reitze, Professor of Environmental Law at George Washington University Law School, every dollar of ADM's profit has cost US taxpayers $30. To ensure the continuation of ethanol subsidies, the Renewable Fuels Association (of which ADM is a member) had reportedly contributed $772,000 to Republican coffers between 1991 and 1992.

Biofuels have already been taken out of the hands of farmers and turned into big business. Where the demand for ethanol has benefited corn farmers, it has done so only at the expense of cattle farmers, for whom the cost of animal feed has vastly increased. Ethanol production from corn has been estimated to add $1 billion to the cost of beef production.

In the USA, a litre of petrol costs roughly 33 cents to produce; a litre of ethanol can cost up to $1.88. At present, these differentials are disguised behind subsidies, tax breaks, levies and laws. Germany subsidises biofuels to the value of 47 cents per litre, and France to the value of 33 cents per litre.

In his recent pre-Budget report, Gordon Brown reduced the tax on UK blended biofuels from 53 pence per litre to 8 pence per litre. In Brazil, although subsidies of ethanol officially ended in the mid-1990s, a number of 'incentives' still exist. Personal diesel-engined vehicles have been banned, to encourage the uptake of ethanol burning models, despite the greater fuel economies of many diesel cars. In addition, new 'flex-fuel' cars – models that can run on both ethanol and petrol – have been made available at a reduced rate of VAT.

Behind this raft of measures, it is difficult to see whether biofuels could ever compete with fossil fuels without continued subsidies, covert or otherwise. It is important to remember exactly what is being subsidised as well – excessive motor transport. As Michael O'Hare, Professor of Public Policy at UC Berkeley, pointed out in a recent article: 'Driving your car with a gallon of ethanol doesn't do 50 cents worth of good for society, it just does less damage than driving it with gasoline.'

CLAIM 3 It is the solution to our energy problems

Recent figures show that if high-yield bio-energy crops were grown on all the farmland on earth, the resulting fuel would account for only 20 per cent of our current demand. The Organisation for Economic Cooperation and Development (OECD) published research which shows that more than 70 per cent of Europe's farmland would be required for biofuel crops to account for even 10 per cent of road transport fuel.

But there are more basic reasons why biofuels cannot be the answer to our energy problems. A normal petrol engine cannot run on more than a 15 per cent ethanol blend, and it is considered too expensive to modify a car after manufacture. Given that the average life expectancy of a vehicle is 14 years, it would take approximately this long to replace the current petrol fleet. By 2021, however, it could already be too late to make a difference to serious global warming.

The European Union Biofuels Directive requires that all EU member states have a blend of 5.75 per cent biofuel in their road transport fuels by 2010. However, a litre of biodiesel contains 12 per cent less chemical energy than an equivalent litre of mineral diesel, and is five per cent less fuel-efficient when burnt in an engine. A litre of ethanol contains 33 per cent less energy than a litre of petrol, and a blend of 85 per cent ethanol to 15 per cent petrol (known as E85) can see vehicle fuel consumption rise by 31 per cent. The UK uses approximately 26 billion litres of petrol each year. If this were to be blended with 5.75 per cent bioeth-anol, the net energy contained in a litre of pump fuel would drop by approximately 2 per cent. In addition, ethanol blended fuels cannot be transported by pipeline, as the ethanol attracts water, which would render it ineffective as a fuel. It must, therefore, be transported by road. This means that an extra 521.5 million litres of fuel would need to be transported annually to make up for the energy deficit – equivalent to an extra 16,478 tanker journeys in the UK each year, which could increase the carbon emissions involved in distribution from refinery to tanker terminals by 38 per cent.

CLAIM 4 It's clean and safe

The biofuels ethanol and biodiesel are often referred to as 'clean-burning' fuels, and much has been made of their lower emissions of carbon monoxide. However, analyses of exhaust emissions from cars burning ethanol show an increase in nitrogen oxides, acetaldehyde and peroxy-acetyl-nitrate.

Likewise, cars burning biodiesel have been shown to emit higher levels of nitrogen oxides than those burning mineral diesel. Nitrous oxides are powerful greenhouse gases and can lead to the depletion of atmospheric ozone. At low levels they can react with VOCs and create low-level ozone, which can give rise to urban smog and respiratory problems.

When ethanol is blended with gasoline it makes the entire fuel more volatile. This means that it is more likely to evaporate, especially in the summer, through rubber and plastic parts of the fuel system. A study by the California Air Quality Board in 2004 found that blending ethanol with petrol increased fuel evaporation by 14 to 18 per cent. This means a higher quantity of hydrocarbon and nitrogen oxide emissions, as the fuel dissipates from vehicle tanks.

Ethanol is a solvent, and corrodes soft metals including aluminium, zinc, brass and lead. This means that existing underground storage tanks designed for fossil fuels and made from metal or even fibreglass could leak if filled with ethanol-blended fuel, leaching pollutants into groundwater. If this happens, there is evidence that pollution would be even more widespread with a petrol-ethanol blend than with petrol alone. The presence of ethanol in the mix increases the persistence of the toxic substances benzene, toluene, ethylbenzene and xylene, and can cause them to travel 2.5 times farther in groundwater than would have been the case with a non-ethanol blended fuel.

Biodiesel is also a natural solvent, whereas mineral diesel is not. This means that parts of the fuel system, particularly in older cars, may start to corrode when biodiesel blends are used. This can lead to a build-up of deposits in the fuel system and engine, which in turn could reduce vehicle performance and increase fuel consumption.

Biodiesel also solidifies at around 4-5°C. This means that it must be pre-heated on cold winter mornings before it will flow from the tank. One biodiesel information website recommends the use of highly toxic 'anti-gelling' compounds mixed in with the fuel – or a 'heated garage'. It is this kind of solution that typifies the utter dependence of biofuels upon the continuing extravagant use of fossil energy.

CLAIM 5 It's good for the environment

A bio-refinery is an extraordinarily wasteful facility. For every litre of bioethanol produced in a modern refinery, 13 litres of waste water are generated. This waste water contains dead yeast and small amounts of ethanol, and has what is known as a Biological Oxgen Demand (BOD) – which means that the effluent competes with various other organisms in the water for available oxygen.

If effluent with a BOD is discharged into a watercourse, microorganisms in the water use oxygen in the water to break down, or oxidise, the pollutants, thus making the oxygen less available for other species. In extreme cases, fish and other aquatic organisms can suffocate from lack of oxygen.

The BOD of raw sewage is around 600mg per litre; that of bio-refinery waste water can be between 18,000 and 37,000mg per litre. This must be treated before it can leave the refinery, which requires an energy input of around 69,000 kilocalories, roughly equivalent to 306.7 cu ft of natural gas per 1,000 litres of ethanol produced.

In sugarcane ethanol plants, which are particularly common in Brazil, 12 cu ft of a thick, dark red, acid substance called 'vinasse' is left behind for every cubic foot of ethanol that has been produced. It is piped from the refinery to settlement ponds, where it is allowed to cool. If vinasse is left in the pools, anaerobic breakdown will lead to the production of methane, a greenhouse gas.

Some refinery operators have chosen to dilute vinasse at a ratio of up to 1:400 with water for use as a fertiliser on the sugarcane plantations. But it is so potent that the soil has to be carefully monitored to make sure that plants are not scorched or waterways polluted. Some farmers have used vinasse as a 'binding agent' on gravel drives, only to find that it corrodes the underside of vehicles that frequently drive over it.

Ethanol refineries also produce significant amounts of nitrous oxides (a greenhouse gas more than 300 times more potent that CO_2), carbon monoxide and VOCs (also linked to the destruction of the ozone layer and damage to human health). Their emissions are so high that in March 2006, the Environmental Protection Agency in the USA was forced under political pressure from the biofuels lobby to propose raising the threshold for facilities considered to be 'minor source of emissions' from 100 tons per year to 250 tons per year.

Mark Anslow is a reporter for The Ecologist. An annotated version of this article is available on our website

How green is my tank?

Unless automakers accept the need for serious action on fuel economy in addition to lower-carbon fuels, biofuels will remain a dangerous distraction. **Harriet Williams** reports

'Live Green, Go Yellow' exhorts a multimillion-dollar ad campaign from General Motors (GM), the world's largest automaker, promoting flexible fuel cars capable of running on blends of up to 85 per cent ethanol, mainly derived from corn. 'GM FlexFuel vehicles lead the way to a cleaner, less oil-dependent future, when they run on renewable, US grown fuel. Join the ride!'

Global bioethanol production more than doubled between 2000 and 2005 to 36 billion litres, with Brazilian sugar cane and US corn together accounting for more than 80 per cent of this total. Production of biodiesel, starting from a much smaller base, expanded fourfold to nearly four billion litres, nine-tenths of it produced in the EU. Countries as varied as Colombia, Japan, Canada, South Africa and the Philippines are contemplating mandatory biofuel blends for their auto fleets. The world's eyes are focused enviously on Brazil, nicknamed the Saudi Arabia of biofuel, where bioethanol accounts for 40 per cent of the fuel used by the country's cars and avoids the need for roughly $69 billion a year in oil imports.

Despite all this activity, in 2005 ethanol powered only 0.8 per cent of the distance travelled by the world's auto fleet. If and when this proportion increases, the physical availability of biofuel will be only one factor – future trends in fuel economy of individual vehicles and in the total mileage people travel are equally important.

GM and the other Big Three US automakers, Ford and Daimler Chrysler, have all vowed to double production of flex-fuel vehicles by 2010. Officially, car-makers like the yellow stuff because it offers the prospect of boosting energy security – a hot topic in the USA – and reducing greenhouse gas emissions, which strikes chords in Europe.

Unofficially, biofuels offer automakers a convenient way out of any number of tricky corners. Ten per cent of the world's oil is burnt on US roads – one in every two barrels it consumes – and automakers were clearly in the frame when President Bush decried the country's 'addiction to oil' and its unpleasant side-effects, which include spending half a million dollars every minute on petroleum imports. High oil prices and the war in Iraq have fuelled criticism of the Big Three for producing gas-guzzling vehicles, while nimbler Asian rivals such as Toyota and Honda increase market share with less fuel-hungry technologies such as hybrid engines.

Then there is all the bad press over climate change. Road transport already accounts for around one quarter of carbon emissions in most developed countries, a figure set to grow as car use increases relative to other energy-hungry sectors that are reining in their emissions.

An obvious fix for these ills – increasing the mileage per gallon (mpg) travelled by the average car – has conspicuously failed to materialise. And yet a 10mpg increase in the average fuel economy of US cars, for instance, would reduce oil demand by 3.5 million barrels a day. By contrast, even if the USA diverted its entire corn yield to ethanol, it would only displace 1.35 million barrels, or 15 per cent, of the nine million barrels (and rising) consumed by US cars every day.

Instead, the trend for bigger, more powerful vehicles has cancelled out a series of impressive efficiency gains. The average weight of new US cars has increased 24 per cent between 1981 and 2001, with a 93 per cent increase in horsepower over the same period. All this means that the average fuel economy for the whole fleet is an oil-thirsty 19.6mpg – worse than that of the Model T Ford launched in 1908. The reason is simple: profit margins are highest on large, fast cars, and automakers have deliberately stoked consumer demand for these vehicles. A 2006 Friends of the Earth report on car advertising in the UK, for instance, found that nearly two thirds of adverts were for vehicles in the two most polluting categories.

Political failures

Car-makers' dismal record on improving fuel economy has led to a clutch of initiatives and agreements on fuel economy action on both sides of the Atlantic, which the industry is determined to fight off.

In the USA, the federal fuel economy standard for new cars has stalled at 27.5mpg since the mid-1980s, and automakers have filed a legal challenge against Californian proposals mandating lower carbon emissions. Over the years, the state of California has helped set the agenda for US environmental politics and, with another 13 ▶

states lined up to adopt the proposals, and California suing automakers for contributing to global warming, car manufacturers are fearful that the game may finally be up.

In Europe, policymakers are smarting from the failure of a high-profile voluntary agreement that saw automakers pledge to reduce carbon emissions, whose success rested upon efficiency gains through vehicle technologies. The average new European car now emits a hefty 162 grams of CO_2 per kilometre, a far cry from the 140g target agreed for 2008.

It isn't as if 140g or less is unrealistic – in fact, these cars are already a commercial reality. The Toyota Prius – a large, family car – produces just over 100g per kilometre, and in the UK alone more than 30 other models that produce emissions of less than 120g are on sale.

However, the fact is that binding targets for fuel economy are a *bête noire* for the auto industry, which claims that there are cheaper, simpler ways to reduce auto emissions than through vehicle efficiency. Through bad maths or bad faith, the auto industry has consistently exaggerated the compliance costs associated with new regulation enacted on safety or environmental grounds. For instance, it estimated that catalytic converters would cost up to £600 per vehicle. The real cost worked out around £50.

Whatever the truth of vehicle technology – and remember that the energy-hungry air-con systems and heated seats that shift premium cars today were partly made possible by engine-efficiency gains – it suits automakers to push for other options. Cleaner fuels, rather than leaner vehicles, are far more consistent with the industry's bottom line, allowing automakers to continue to churn out vehicles that make the biggest profits, namely gas-guzzling luxury cars and SUVs.

Furthermore, those profits are artificially propped up by import tariffs and other subsidies that protect biofuel producers in both the US and EU markets. Yet there is also a much-overlooked cost to the consumer. High biofuel blends may be competitively priced at the pumps, but the lower energy content of ethanol means that motorists need 1.5 gallons to drive the same distance they can on a gallon of petroleum.

> Ethanol's lower energy content means motorists need 1.5 gallons instead of 1 gallon petrol

All the ugly realities that tarnish today's biofuels – low land availability, low efficiency and high cost – are supposed to evaporate with the advent of the much-vaunted second-generation biofuels, in which plant wastes are literally pressed, digested and genetically manipulated into service as high-energy fuels, with massive carbon savings to boot. But a number of technological breakthroughs are needed to make cellulosic ethanol cost-effective, and the consensus is that large-scale deployment is at least 10 years away.

Even if vast quantities of clean, sustainable and cheap biofuel were there for the taking, there is the question of putting it in the tank. All that refining, processing and distribution requires an 'industrial-scale infrastructure', in the parlance of the oil industry, and so far that industry has shown little interest in cultivating a competitor to its number one product, petroleum, to which operating systems are geared. The great irony of GM's love affair with flex-fuelled vehicles is that only a fraction of them will ever run on a high-ethanol blend – E85 is currently available at less than 600 of America's 170,000 service stations.

Meanwhile, the global car pool continues to grow at a pace that far outstrips biofuels' limited ability to displace petroleum demand. The fleet is expected to double by 2020 to 1.2 billion cars, one for every 6.5 people. If all these cars are as fuel-intensive as those today, biofuels will struggle to become a significant proportion of the fuel mix, even if production volumes are ramped up. And if road transport continues burning oil at today's rate or higher, pretty soon we will be dipping into unconventional and environmentally devastating fossil fuels such as oil shales for petrol, whose much larger energy extraction bill will cancel out any greenhouse gas benefits accruing from modest biofuel blends.

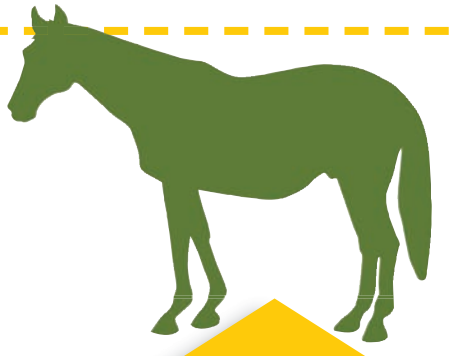
Lobbying hard

The auto industry's political power should not be underestimated. For instance, in the USA, auto manufacturers and dealers together make up one of the biggest campaign donor groups in politics, accounting for more than $105 million in contributions to federal candidates and party committees since 1989. Around 75 per cent of those contributions have gone to Republicans.

Contrast this with the lobbying/purchasing power of smaller groups promoting fuel

Horsepower to pedal-power

We often see the development of the car as a sign of how far we've come. But just how far is that? We in the industrialised nations may have made gains in terms of speed, but along the way we have made little progress in terms of our impact on the environment – in fact, quite the reverse. Has the wheel finally come full circle?



THE HORSE
1 horsepower (hp)

MODEL T FORD
20hp
25-30mpg
45mph

economy, such as the Sierra Club, which is currently calling for fuel efficiency standards averaging at least 40mpg for all vehicles within 10 years. The Sierra Club has spent just $1.3 million lobbying government since 1997.

Perhaps not surprisingly then, since 2001 Congress has rejected at least five efforts to increase fuel economy standards. The most recent attempt, an amendment introduced by the Democratic senator for Illinois, Dick Durbin, to President Bush's 2005 energy bill, was defeated in June. The amendment would have increased efficiency standards for passenger vehicles to 40mpg and to 27.5mpg for pickups and other non-passenger vehicles.

In the meantime, according to Energy Department data, petrol use in the USA increased from 332 million gallons a day in January 2001, to 380 million gallons a day during the first week of September 2005, a 14 per cent increase. In the EU also, fuel use is increasing. Compared with 12 million barrels a day in 2000, it is predicted to grow to 13.2 million barrels a day by 2020; 93 per cent of this increase is likely to be accounted for by transport.

Double standards

For automobile manufacturers, the promotion of biofuels is worthwhile because it absolves them of all responsibility for their products and heads off unwelcome policies on fuel economy. So far, this strategy is working pretty well. In the EU, the European Automobile Manufacturers Association (Association des Constructeurs Européens d'Automobiles, or ACEA) is vigorously promoting an 'integrated approach' to reducing vehicle emissions, which basically comprises passing on responsibility for auto emissions to motorists, road designers and national governments – anyone but the auto industry, in fact. 'It should not be, it cannot be the responsibility of the automotive industry alone,' ACEA secretary general Ivan Hodac has said. One of ACEA's leading alternatives is, naturally, biofuels.

In his latest State of the Union address, President Bush made biofuel the centrepiece of his call to cut domestic petrol consumption 20 per cent by 2017. While Bush also speculated upon improving fuel economy, he was careful not to announce any specific mechanisms for doing so.

The US has already signed a blatant fuel economy loophole into law in the name of promoting biofuels. Under the so-called flex-fuel discount, automakers pick up credits towards their federal fuel economy targets when they manufacture E85-capable cars. Car-makers churning out lots of these vehicles – the majority of which never use E85 – are in essence set a lower fuel economy standard. 'There's no way Detroit would be producing these cars if they weren't allowed to weaken mpg standards in return,' says Dan Becker, director of the Sierra Club's Global Warming Programme.

Jos Dings, Director of The European Federation for Transport and Environment, is adamant that biofuels should be additional to action on car technology, not a substitute. 'CO_2 targets for new vehicles have to be met through car-related measures, not through fuel measures,' he says. 'Anything that would suggest greenhouse gas savings from biofuels could count towards these targets is a double counting of efforts and a weakening of policies. That is unacceptable in a time when climate change and oil dependency concerns are more paramount that ever.'

The next two years will see the battle over fuel economy enter a crucial new phase. The EU will be taking decisions on what should replace the failed voluntary agreement, and the US courts will rule on whether or not California can take strong, independent action to reduce carbon emissions from road vehicles. Other countries will be watching, including China – the world's second largest auto market, which has already set fuel economy standards of its own.

> We cannot expect to grow afresh each year sufficient fuel to replace fossil energy

Ultimately, we cannot expect to grow afresh each year sufficient fuel to replace the masses of fossil energy we currently mine to power cars. Biofuels only have a part to play under a scenario where greatly improved fuel economy reduces petrol demand to a level with which photosynthesis can compete. Unless automakers accept the need for serious action on fuel economy in addition to lower carbon fuels, biofuels will remain a dangerous distraction.

Harriet Williams is a freelance journalist and environmental consultant, specialising in transport issues

THE HUMMER
325hp
8-10mpg
95mph

TOYOTA PRIUS
110hp combined
85mpg
42mph electric
105mph gas & electric

THE BICYCLE
0.65hp
15mph

The next genetic revolution?

A member of the Brazilian landless worker movement burns transgenic soya seeds

We didn't want GM on your table, but the crucial question now is, will we allow it in our tanks? **Robin Maynard** and **Pat Thomas** report

In recent years, as horror headlines about genetically modified (GM) crops have vanished from the mainstream media, it may have seemed as if those battling to stop them being produced had won. In reality the lack of GM fanfare has been little more than a quiet moment before the storm. The ability of biotech companies like Monsanto and Syngenta to improve agricultural production is viewed as a lynchpin in the success or failure of the biofuels revolution. If the biotech industry can cleverly reposition GM crops as a non-food, industrial 'green' energy commodity, it might just succeed in persuading an otherwise reluctant public that GM is a good thing.

Biotech companies aim to do this in two ways. The first is the genetic modification of crops such as corn, to increase drought resistance and yield and to reduce the cost or increase the efficiency of ethanol production. The second is the creation of powerful enzymes that will efficiently convert crop waste or plants such as switchgrass, which consists largely of hard-to-break-down cellulose, into ethanol.

It is estimated that it will take 10 to 15 years of research and development work to make the latter technology viable. But genetically modified biofuel crops are already a reality, being grown and tested in real fields in real world conditions, especially in the USA.

GM corn now makes up a substantial part of all corn destined for ethanol production in the USA and Monsanto reports that sales of its corn seeds and traits have risen 38 per cent in the last year alone. However, since these varieties offer no particular advantage over conventional corn for ethanol production, it is possible that the diversion of GM maize into ethanol production reflects the extent to which this commodity has been rejected as a food and feed staple. And as biodiesel production relies on oils such as sunflower, palm or soya, increased demand will also mean more demand for GM oilseed crops, in particular soya beans.

In Europe, where public resistance to growing GM crops remains intractable, planting of GM crops is still very limited. Most energy crops in Europe are in the form of non-GM sugarbeet, rapeseed and corn. However, Syngenta has recently applied for permission to import a GM maize into Europe for processing into fuel. The GM maize variety, 'Event 3272', has been modified to express an enzyme (AMY797E), a key component in the production of bioethanol from maize that shortens the time it take to ferment the feedstock into alcohol. The company have also developing a GM cassava for use in biofuels.

Food producers are also jumping on the bandwagon. In Europe, the Confederation of the food and drink industries of the EU (CIAA) has recently called for more GM rapeseed varieties to be authorised for import into

the EU. By authorising new GM rapeseed varieties the CIAA hopes that pressure on non-GM European rapeseed for food purposes could be reduced.

Encouragement from eminent scientific and political figures completes the pincer movement. Recently, UK Chief Scientist Sir David King commented on a government website that 'public acceptance is likely to be greater for GM non-food crops.'

Likewise, the biotech industry heartily welcomed President Bush's 2006 State of the Union address. In a statement the following day, James Greenwood, President and CEO of Bio – the biotech industry organisation representing more than 1,100 biotech companies, academic institutions and centres in the US and worldwide, commented that 'the biotechnology industry can play a vital role in meeting the President's stated goal of increasing America's energy security by replacing imported oil with domestically produced alternative fuels'.

Greenwood went on to state that if the President's Advanced Energy Initiative was successful, 'industry will begin investing in commercial-scale biorefineries, and consumers could begin buying more products – including fuel for their cars and trucks and bioplastics – produced in America's heartland. America's breadbasket could soon become our energy fields as well.'

Biotech companies have also set their sights on other continents, where public resistance is lower or less organised and environmental restrictions weaker or absent. Here too, they seek to create a distinction in the public's mind between GM as food (not acceptable) and GM for industrial uses (acceptable).

For example, President Lula of Brazil recently declared that GM soya will be used for biofuels, while 'good soya' will be kept for human consumption. A high percentage of soya is already available in GM versions and Argentina has recently established incentives to expand GM soya bean cultivation for biodiesel use.

Last year, Tony Blair's Africa Commission declared that mass growing of biofuels in Africa, 'provides a sustainable development path for the many African countries that can produce biofuels cheaply'. This apparently holy pairing of mutually beneficial environment and development objectives was also firmly on the agenda at the recent climate talks in Nairobi, held under the auspices of the United Nations Framework Convention on Climate Change in November 2006. In a statement put out at the meeting, a coalition of rainforest and development NGOs warned delegates that:

'The Genetic Engineering industry is keen to use acceptance of biofuels as a strategy to speed up GM acceptance in Africa, and the industry is working on a number of GM biofuel crops. Most African countries have yet to develop biosafety policies on GM crops, and are cautious of the difficulties in regulating and monitoring this novel food system, which could easily cross-pollinate and contaminate conventional agriculture.'

Currently, South Africa is the only African country that grows GM crops commercially. Persuading others to endorse GM biofuel crops as an acceptable technological tool to combat climate change would be a huge coup for the biotech industry, reversing years of hard-fought resistance by African governments and citizens to prevent GM contamination of their indigenous agriculture.

Whether GM or not, mass planting of biofuel crops would undermine the continent's already fragile food security, as food crops grown for local consumption would compete for the best land with fuel crops grown for export, as well as driving further clearance of natural forests for plantations, as has already happened in Malaysia and Indonesia.

Oil palms currently dominate such plantations, but the biotech companies are developing biofuel GM trees engineered for insect resistance, faster growth, and increased cellulose production. Cellulose would be the key feedstock for producing fuels from trees, but the process requires the use of additional genetically-engineered enzymes to break down the cellulose into fuel.

To this end, biotech companies are working on ways to reduce the amount of lignin in trees so as to increase the proportion of cellulose available for fuel production. But lignin is the glue that holds trees together and the substance that provides the rigidity necessary for them to stand up. No GM tree crops have been grown commercially yet, but they are being promoted as 'next generation' crops both to produce biofuel and to act as carbon sinks. However, environmentalists fear that GM cross-pollination with natural forest trees not bred to cope with reduced lignin content could lead to forests full of 'floppy trees'. Cross-pollination is an issue of wider concern, too. Tree pollen is able to disperse over hundreds of miles, so GM tree plantations could cross-pollinate with non-GM trees and contaminate much wider areas of remaining natural forest.

Biofuels and industrial biotechnology constitute a key strategic sector for the biotech industry. Their alleged role in combating climate change is being exploited to resurrect the reputation and expanding the planting of GM crops globally. Lax regulatory standards (especially in the USA) mean that unless the powerful energy of consumer outrage can be harnessed – and quickly – the GM juggernaut will be rolling down a road near you very soon.

PHOTOGRAPHS X 2 © AFP/GETTY IMAGES

Indian farmers in New Delhi protest against GM trials

Less waste, more speed

Growing crops to solve the planet's energy needs doesn't work. Recycling the energy in our waste just might have a significant part to play. **By Jeremy Smith & Jon Hughes**

Manure and slaughterhouse waste, along with all other forms of organic matter, can now be used to run biogas power stations

Bush's latest' state of the union speech – wanting 20 per cent bio-fuels from food crops to be driving the US fleet in 10 years – makes two things remarkably clear. First even the Toxic Texan now sees the environment as a vote winner. And second, people such as him are still looking for the answers in the wrong place.

To see where the answers might lie he needs to look beyond the cornfields of the Midwest. To somewhere aiming to be nuclear free by 2010 and oil-free by 2020. To Sweden. This radical energy policy, the most ambitious of its kind in the world, was introduced by the socialists and adopted, after a recent change of government, by the equivalent of the Tories. In terms of ecological consciousness and seeking bipartisan solutions to environmental problems it affirms that Sweden is a good 20 years ahead of either Britain or America.

The country's environmental awakening started in the Eighties when two separate but connected events shocked the country. First there was the bleached coffee filter paper scandal. People liked the filter paper for their coffee machines to be white. But then it was discovered that the chemicals used in the manufacturing process left cancer-causing residues and were causing environmental degradation simply so we could have something that looked aesthetically pleasing. Then dead seals started to appear off the north-west coast. The Swedes put two and two together and realized that the fundamental processes used in manufacturing were having a direct impact on the environment. And determined that they were going to do something about it.

So they set their minds to addressing these issues, as fishing, forestry and agriculture are critical parts of their economic portfolio. How best to use their natural resources is tantamount. Biofuels there have been used

as a fuel extender for petrol-engined vehicles for years. Today, almost 40,000 cars in the country are powered by some form of alternative fuel. Last year sales were up 168 per cent. By the end of 2006 sales of alternative fuel cars were expected to account for about 20 per cent of all new cars sold.

However, the biofuels approach currently being endorsed by Bush and others is already recognised by the Swedes as being an ultimately unsustainable solution and of little help even in meeting the modest targets for cutting $C0_2$ emissions set by the EU. So while the rest of the world is only now belatedly jumping on the bio-fuels bandwagon, the Swedes have already moved on to the next phase.

Today, they are concentrating on non-food-crop biomass for energy production and fuel, in the form of biogas, for cars, both of which have far greater potential to play a long and lasting role in providing green fuel and green energy. Rather than sow new plants that compete for space with food crops, they are using the waste products of their society – anything from woodchip to slaughterhouse slurry – and turning them into fuel.

In December last year they opened the world's largest biogas plant. Costing 3.2 million Euro, the Gothenburg plant will be able to produce 1,600 cubic metres (cu/m) (56,000 cubic feet) of biogas per hour. This will be done by refining gas from the city's wastewater treatment plant into biogas.

Outside of Gothenburg, the government and 25 local municipalities have backed an initiative to build 200 new biogas stations over the next two to three years. Expansion on this scale and at this speed will replace the need for around 35 million litres of petrol and diesel fuel, cutting emissions by 50,000 tonnes a year; a clear signal to business and the public to have confidence and invest in the sector.

The country already has 779 biogas driven buses. In the city of Linköping for example, all the buses and many of the taxis run on biogas produced locally from slaughter waste, agricultural waste and other kinds of food/organic waste. Across the country, sales of biogas-powered cars increased by 49 percent in 2005.

> To see where the answers might lie, we need to look to a country aiming to be completely oil free by 2020 – Sweden

Not that they've stopped there. Last year Sweden unveiled the world's first biogas powered train. Driven by two biogas bus engines it can carry up to 54 passengers at 81 miles an hour and run for 372 miles before it need refuel. It cost them just 1.08 million Euros to develop.

Last year Sweden unveiled the world's first biogas powered train. Driven by two biogas bus engines it can carry 54 passengers at 81mph, and run for 372 miles without refuelling

Closing the loop

Biogas is produced in essentially two different ways – by biodigesters and bioreactors. From the cities of Sweden to remote rural villages of China anaerobic biodigesters are becoming increasingly commonplace to see. These are essentially micro-generators where animal manure and organic matter (food waste, agriculture wastes and so forth) are fed into a chamber. They combine with the oxygen in the air and heat up naturally, just as in a compost heap. As they do so they produce two things; gas (predominantly methane with a small percentage of carbon monoxide), and a slurry of sterile (non-toxic) nitrogen compounds.

The gas is then piped to a generator, which uses it as fuel to supply power to the village or farm for household appliances and electricity driven farm machinery. Anaerobic digestion also removes the need for petrochemically produced fertliser, which in the UK accounts for around 14 per cent of GHG emissions – the same as industry. The result: with the exception of the release of a tiny amount of methane gas, a totally green whole cycle power system.

Aside from the climate benefits, replacing costly chemical fertilisers with cheap, produced on site ones from an anaerobic digesters can also boost farm incomes. In Germany this potential is already being harnessed. There, farms with herds of around 500 head of cattle are paid to 'biodigest' their wastes, the gas from which is then bought and collected. For struggling farmers in the UK, biodigesters could make a dramatic impact on their balance sheets. For example, an average hill farm in Wales running 500 sheep on 100 acres – the minimal possible to make it anyway approaching economical – would spend around 30 per cent of its annual income on petrochemically produced fertiliser.

Bioreactors run on a slightly different principle to biodigesters, and use both heat and pressure to speed up waste conversion, like giant kitchen pressure cookers. And they do it on a grander scale and faster. Where a biodigester would run over a 10 day cycle, a bioreactor completes the same conversion of matter to energy in a few hours, recycling some of the energy it creates to power its

own operation. Construction of a bioreactor has recently started in Lockerbie. When in operation the plant will generate enough electricity to power 70,000 homes, offsetting 140,000 tonnes of greenhouse gas emissions each year. The Lockerbie bioreactor will be fuelled by biomass, sourced from the waste matter from the nearby wood processing and pulping industries; a resource that would otherwise by fly-tipped, burnt or landfilled. It's a solution suitable to Scotland (and potentially Wales) because of its extensive commercial forests.

Closer to home

Bioreacators' potential doesn't stop there. The reactors can process practically anything – all human and animal effluent, animal carcasses, garden waste – and convert it into energy. So, for instance, the effluent in rivers such as the Thames could in principle be filtered out to create power, whilst cleaning up the river in the process.

The Institute of Science in Society (ISIS) has calculated that there are somewhere in the region of 88 million tons of effluent and organic waste suitable for anaerobic digestion in the UK. If converted into fuel this could provide 11.7 per cent of our total energy needs and save at least 15.8 per cent of our carbon emissions. Or, create enough liquid fuel to power half our transport needs, saving around 50 per cent of our current transport emissions, which themselves account for 14 per cent of the UK's total emissions.

Admittedly waste biomass is not quite as clean as carbon neutral forest biomass. Nonetheless it is far cleaner than simply incinerating our waste. For every ton of waste currently incinerated, 2.8 tons of $C0_2$ are emitted. When converted to energy in a bioreactor, the process is 10 times cleaner, as the reactors use far less energy than a waste incinerator, and can be fitted with carbon dioxide scrubbers on their exhausts.

Furthermore, they are 85 per cent efficient at recovering energy from waste: an incinerator is only about 10-15 per cent efficient, or less. In sum: you can get five to eight times as much energy, all of it green, from bioreactors than incinerators, at a fraction of the carbon dioxide output. The same applies to anaerobic digesters, which are also very energy efficient.

Another immediate benefit of pursuing the biomass/biogas line is that in the UK we already have the infrastructure in place. Gas travels through pipes, and the pipes already exist to deliver natural gas. Localising production also answers a key question of energy security and addresses the problem of energy wasteage, with 7-25 per cent of the electricity produced in the UK currently being lost simply while being transported around the national grid.

> The UK's first dung-fuelled power station opened in Devon in 2002, processing 150,000 tonnes of slurry each year

It might also lead to proper funding of recycling services as millions of tons of waste and rubbish can be converted into hundreds of millions of pounds worth of valuable energy, to be sold back to the consumer.

Despite lack of support from central government, across the UK, there are several signs at a local level of people taking the initiative for themselves. In Nottingham for example, Trevor Hardcastle of Hardstaff haulage has developed a simple and effective way to convert a diesel engine to drive on biogas. In an industry that praises operators who have a single-digit profit margin he has reduced his fuel bills by £1m annually. Biogas (and natural/propane gas) comes in at half the price of diesel (currently around 46p), and is even cleaner. He has even created his own infrastructure so his trucks can refuel along the motorway routes they travel.

This approach has huge potential. In the UK we currently give bus companies fuel-tax subsidies to the tune of £2bn a year. Yet because these companies operate around fixed points they could – probably more than any other sector – start to convert to biogas immediately. They are already doing this in Mauritius. The only public transport on the island is its bus service, which transports around 200,000 people each day. Earlier last year the country embarked on a scheme to convert its entire fleet of 525 buses to run off biogas, thus tackling its waste, emissions and energy problems in one go.

Wales's first biomass district heating scheme was launched on 30th June 2006. A 500kW wood chip boiler, installed by Dulas Wood Energy, provides heat to Ysgol Vyrnwy School, Community Centre and 30 houses. Wood chip is sourced from within a 20 mile radius of the school and the scheme is operated through a partnership between Powys County Council, Dulas, Severn Trent Water and the residents.

At the National Botanical Garden of Wales, the Great Glasshouse, the offices, shops and catering facilities currently burn factory waste chippings and shavings that would probably end up in a landfill site

A biogas reactor in Denmark. Power plants such as these are beginning to appear all over the world

otherwise. By about 2010 they hope to use coppiced willow and poplar, grown on an adjacent field.

Kingsmead Primary School in Cheshire has a biomass boiler, producing 60 per cent of the school's heating needs. Initially fuelled on wood pellets from a local factory, the boiler now runs on waste factory wood chips sourced in Manchester. In combination with photovoltaic panels and solar water heating, the school has a total energy consumption of about one third of that which is typical for a school of this type and size.

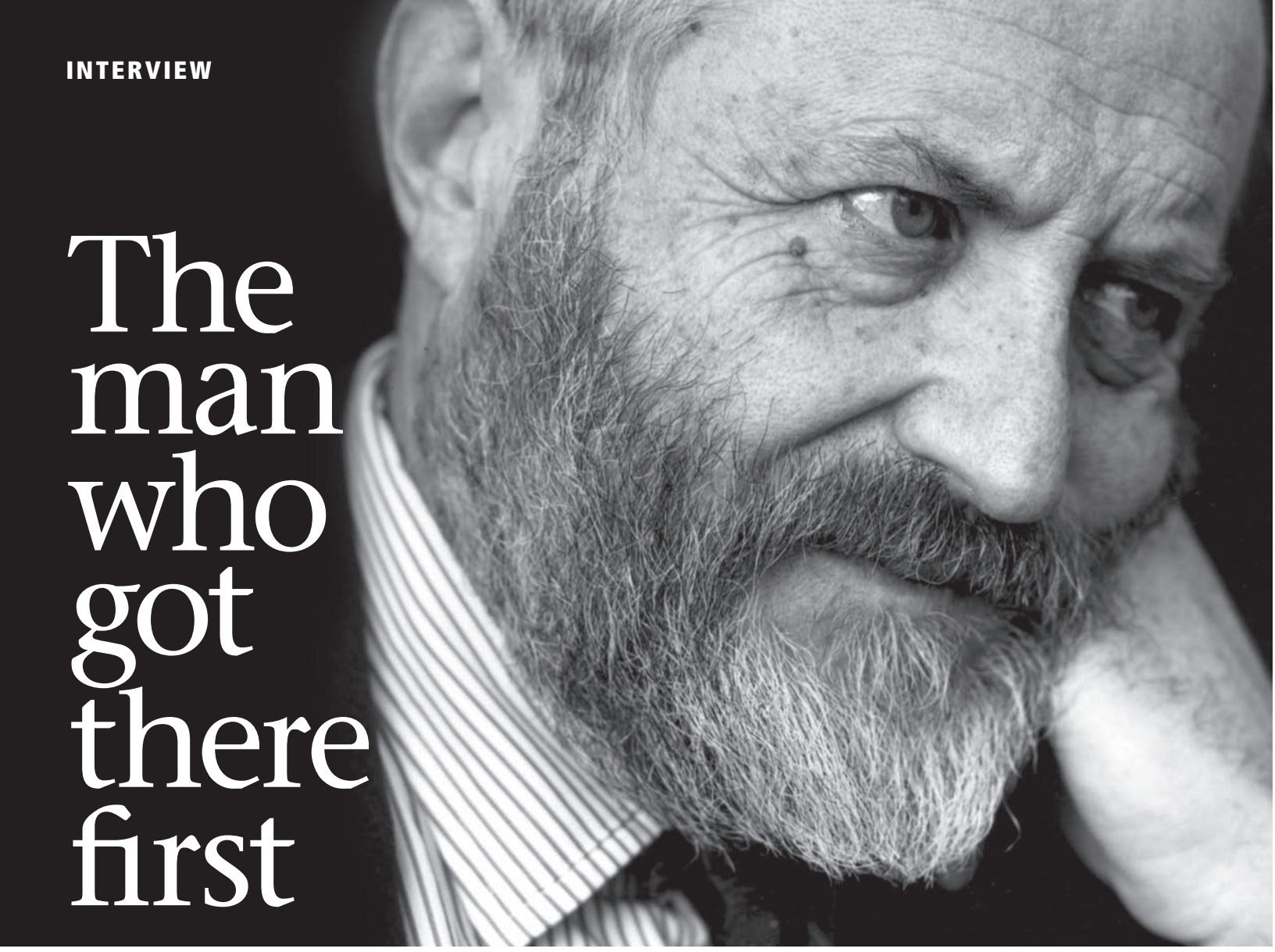
Barnsley metropolitan borough council is replacing its old coal-burning power stations and finding a use for local forestry waste by converting to the use of woodchip burners. Though the project is ongoing, it has already cut its own CO_2 emissions by 40 per cent relative to 1990 levels. Not only do locals now no longer have to put up with the pollution that came with coal – they also have lower fuel bills. Whilst coal costs 1.8 pence per kW hour, biomass in the form of wood chips costs only 1.1 pence per kW hour. Residents at the first biomass scheme to be up and running in Barnsley found their heating bills cut by half due to the new combination of cheap energy, council-installed insulation, and individual energy meters, giving every householder a financial incentive to reduce electricity consumption.

Finally, the UK's first dung-fired power station opened at Holsworthy, Devon, in July 2002. The £7.7 million facility processes up to 150,000 tonnes of slurry each year from 30 local farms.

What all these many schemes show is that our energy and climate crises may be global, but they are best tackled at a local level, with the involvement and support of the community concerned. When people realise that diligent waste disposal coupled with prudent energy useage can free them of dependence on distant and fragile energy supplies while also massively reducing their impact on climate change, they are more likely than ever to wish to get involved.

The biofuels approach of Predient Bush and the like tries to solve one problem only to create many more. The many biogas models adopted by local communities worldwide, meanwhile, work with what we have far too much of – waste – and turn it into something in increasingly short supply – energy. In so doing they answer two problems with one simple and elegant solution.

The man who got there first



Having launched the *Ecologist* 37 years ago, Teddy Goldsmith has been instrumental in everything from the setting up of the world's first political green party to being the first to expose many of the problems associated with global development, such as giant dams and nuclear power. Now 79, he is as vociferous as ever, but finally the rest of the world is beginning to catch up. By **Paul Kingsnorth**

We live in curious times. The leader of the Tory party and the boss of Tesco compete to out-green each other. The prime minister is berated for his polluting holidays. There are millions to be made investing in renewable technologies, and becoming a 'carbon coach' is a respectable career path. Environmentalism has officially arrived, and anyone who's anyone has a compost bin, a cycle helmet or a ludicrously-priced recycled jumper. If you're not on that new biogas-powered train, you'd better run before it leaves the station with all your friends on it, sipping fair-trade coffee and looking smugly down at you.

It might be hard for today's young, enthusiastic greenie to imagine a time when this was far from being the case. A time when being an environmentalist was the minority pursuit of a few hairy oddballs, who society looked upon with the deepest suspicion. A time when organic food was for radical outsiders, not supermarkets, and climate change was not a nice little earner for pinstriped carbon traders but a bonkers theory on a par with David Icke's universal lizard conspiracy. But there was such a time, and it was not so long ago.

Just about four decades ago, in fact. Being 'green' in those days meant that you were on your own. To talk about it, let alone to try to live it, was no guilt-relieving lifestyle choice. You had to be prepared to be ignored, laughed at or dismissed as a loony. You had to make a real effort, and some real sacrifices. Instead of following the crowd, you had to walk away from it.

Those who did so paved the way for what we have now. Like many prophets, they weren't recognised at the time. Some

of them still aren't. The world has moved on, and much of what they did to lay the groundwork for the spread – finally – of green ideas and practices has been forgotten. Such is the fate of prophets. If they get it wrong, they are ignored. If they get it right – well, everyone says they agreed with them all along, and still they are ignored.

The green prophets of those days were no exception. There was Rachel Carson, author of the classic *Silent Spring*, which first warned of the dangers of pesticides and environmental chemicals. There was James Lovelock, the maverick scientist whose Gaia theory was sneered at for years by the peer-reviewed establishment, and who has only recently gained anything like mainstream acceptance. There was E F Schumacher, whose book *Small Is Beautiful* pioneered green economics.

And there was Edward Goldsmith. Now 79 years old and still ruffling feathers, 'Teddy', as he is almost universally known, was one of the most influential pioneers of the green movement, both in Britain and around the world. Determined, brave, inspiring, contradictory, stubborn, often right, sometimes wrong, frequently infuriating but always worth listening to, Teddy Goldsmith's life and career have closely paralleled that of the modern green movement, of which he was one of the founders. As his child finally grows up and flies the nest, his life and work are worth looking back on. Maybe it will even have some lessons for us.

'Of course,' says Teddy now, 'nobody listened to us at all. People seemed to think we were quite shocking at the time. In the Seventies I lived a very ecological life in rural Cornwall. I had a compost toilet that cost me all my friends. If they didn't catch pneumonia because we had no central heating they were sick from the smell of it. I remember on one occasion we had this very charming, beautiful woman staying with us. It was the middle of winter, so she was already blue with cold. She needed to use the loo, so out she went. You should have seen her face when she came back. The next day she invented a transparent excuse about her mother being ill and left. Never saw her again. The look of relief on her face as she was leaving was spectacular.'

He pauses to relish the memory. 'Quite a lot of people thought I was mad,' he says.

Teddy Goldsmith came from a family of wealthy bankers. His father, Major Frank Goldsmith, had been a Tory MP and his brother James went on to become a controversial billionaire. Teddy himself went up to Oxford University in the Forties to study Politics, Philosophy and Economics. A mainstream, establishment career seemed to be beckoning. But it didn't work out that way.

'I realised while I was at Oxford that everything I was being taught was nonsense,' explains Teddy, with typical directness. 'It became quite clear that these people didn't know what they were talking about. Everything was compartmentalised. It was impossible to see the whole picture, or to get anyone else to do so. I found it all quite depressing, so I determined to find out why this was the case, and what the whole picture might be.'

> 'It became clear to me that development was the problem, not the solution'

Upon leaving university, family money gave him 'a certain leisure' to go searching for it. He spent several years reading things that interested him, seeking out his version of a coherent worldview.

'For a whole year, for example, I read about nothing but cybernetics,' says Teddy, with pride. 'But then anthropology grabbed me. It seemed to me that tribal societies had it right. The way they lived in a society with a social and ecological balance and stability seemed eminently sensible to me. After a while, I decided that reading about them was not enough, and that I wanted to see for myself.'

These days, views like this are commonplace. Back then, 'primitive' tribal people were not regarded as having any lessons to teach the rich world. Quite the opposite: they needed to be brought into its hallowed circle. Victorian attitudes still prevailed. They were backward, unenlightened, in need of help.

Teddy had other ideas, so he embarked on a world tour of tribal societies with his friend John Aspinall, the famously misanthropic naturalist. While Aspinall studied the wildlife of the region Teddy lived with the people, and learned lessons that he says have stuck with him ever since.

'I still have my notes from those days,' he says. 'I spent a lot of time in Africa, in tribal societies, and one thing I became convinced of was that these were the only truly 'sustainable' societies I had ever seen. That word is used a lot nowadays, but then it meant nothing. It seemed extremely important to me, and here were people putting it into practice. Yet their very existence was threatened by the remorseless expansion of industrial society.'

When he returned to Britain, Teddy became involved in a fledgling organisation known as the Primitive Peoples' Fund (PPF) – a name which demonstrates just how much things have changed in the intervening years. The PPF later became Survival International, but Teddy, by then, had moved on, along with his ideas.

'The more I thought and read and saw,' he says, 'the more it became clear to me how wide this problem was. Here were people talking about how these poor tribal people needed "development", and yet it was development that was destroying them. And it became clear to me that this applied to wider society as a whole.

'The whole concept of industrial development was responsible for the destruction of ecosystems the world over, and also for the destruction of human societies. It became clear to me that development was the problem, not the solution.'

Many things have changed in Teddy's lifetime, but this is one idea which remains taboo today. From left to right, radical to mainstream, Tony Blair to David Cameron, Bono to the Socialist Workers' Party, everyone agrees that 'development', the golden calf of our secular age, is A Good Thing. Everyone, that is, except Teddy.

By the beginning of the Seventies, Teddy was confident enough in his ideas to try to get them more widely heard. Having discovered a handful of similarly-inclined radicals he decided to start a magazine, to propound and explore these ideas. In July 1970 its first issue appeared. It was to be the first of many; you're holding one of them now, and it is probably the most solid continuing testimony to Teddy's influence over the decades.

The Ecologist has changed hugely in its almost 40 years of existence, and will no

doubt continue to do so. That first issue is already a historical document; very much of its time, testimony to how far both the green movement and the printing industry have travelled.

Printed entirely in black and white, using traditional typesetting techniques, it is full of the eco-concerns of the time: air polluted by coal smoke; overpopulation; nuclear war; the survival or otherwise of hunter-gatherer societies. It contains adverts for Slimcea Bread ('available in both white and brown') and Natural Gas ('Britain's own clean fuel').

That first issue, and the hundreds that followed, crystallised Teddy's take on the world better than anything else. He remained its editor until 1990, and a glimpse through its back issues is a glimpse through the developing politics of the environmental movement. It is also a glimpse into how prescient Teddy and his editorial teams were.

Name any issue of current concern to the green movement – from deforestation to climate change; soil erosion to corporate farming; nuclear power to destructive dams; genetic engineering to the World Bank – and you can bet that Teddy and his ever-growing cabal got there first, and usually got it right. Not that things were always rosy. 'We thought that first issue would sell around 20,000 copies,' says Teddy. 'It sold about 3,000, so I couldn't afford to pay my fellow editor. So he left, and I was on my own.'

Then and now. *Ecologist* covers from 1973 and 2007

Things improved, though, and within two years, Teddy and the team decided to propound their ideas in a more substantial form. The ensuing book, *A Blueprint For Survival*, remains one of the most influential tracts in the history of the green movement. It sold half a million copies, influenced politicians, economists and many others, and helped finance Teddy's magazine for many years to come.

Teddy, meanwhile, and typically, was already moving on. The *Blueprint* had been so influential that it had led a group of young, keen environmentalists to float the idea of forming a political party; the first in the world to be based on green principles. That party – 'People' – was officially founded in 1973, with its founding document based closely on Teddy's Blueprint. Within a few years it had changed its name to the Ecology Party. These days, it's called the Green Party.

> 'He campaigned with a camel on a lead, bearing the slogan, 'No deserts in Suffolk. Vote Goldsmith'

'We founded it a couple of months before a general election,' recalls Teddy, 'and they asked me to fight a seat.' Choosing his father's old constituency in Suffolk, he decided that he 'needed a gimmick' to get noticed. John Aspinall lent him a camel from his zoo, which he used to highlight the issue of soil erosion in East Anglia. He paraded through the streets with the camel on a lead, bearing the slogan, 'No deserts in Suffolk. Vote Goldsmith'. He lost his deposit in style.

Over the next 10 to 15 years Teddy wandered, literally and metaphorically, as the green movement matured around him. In India he worked for the Gandhi Peace Foundation, discovering in the process that 'Gandhi had got it completely right. Small, self-regulating societies, self-sufficient and self-respecting, are the most ecological there can be.' He was employed by the Canadian Ministry of the Environment to review its Third World Aid programme. He set up the Committee on the Future of Nuclear Energy, which blew apart the economic case for nuclear power and shook the political establishment. With the then *Ecologist* editor Nick Hildyard he did the same to the case for large dams in the Eighties.

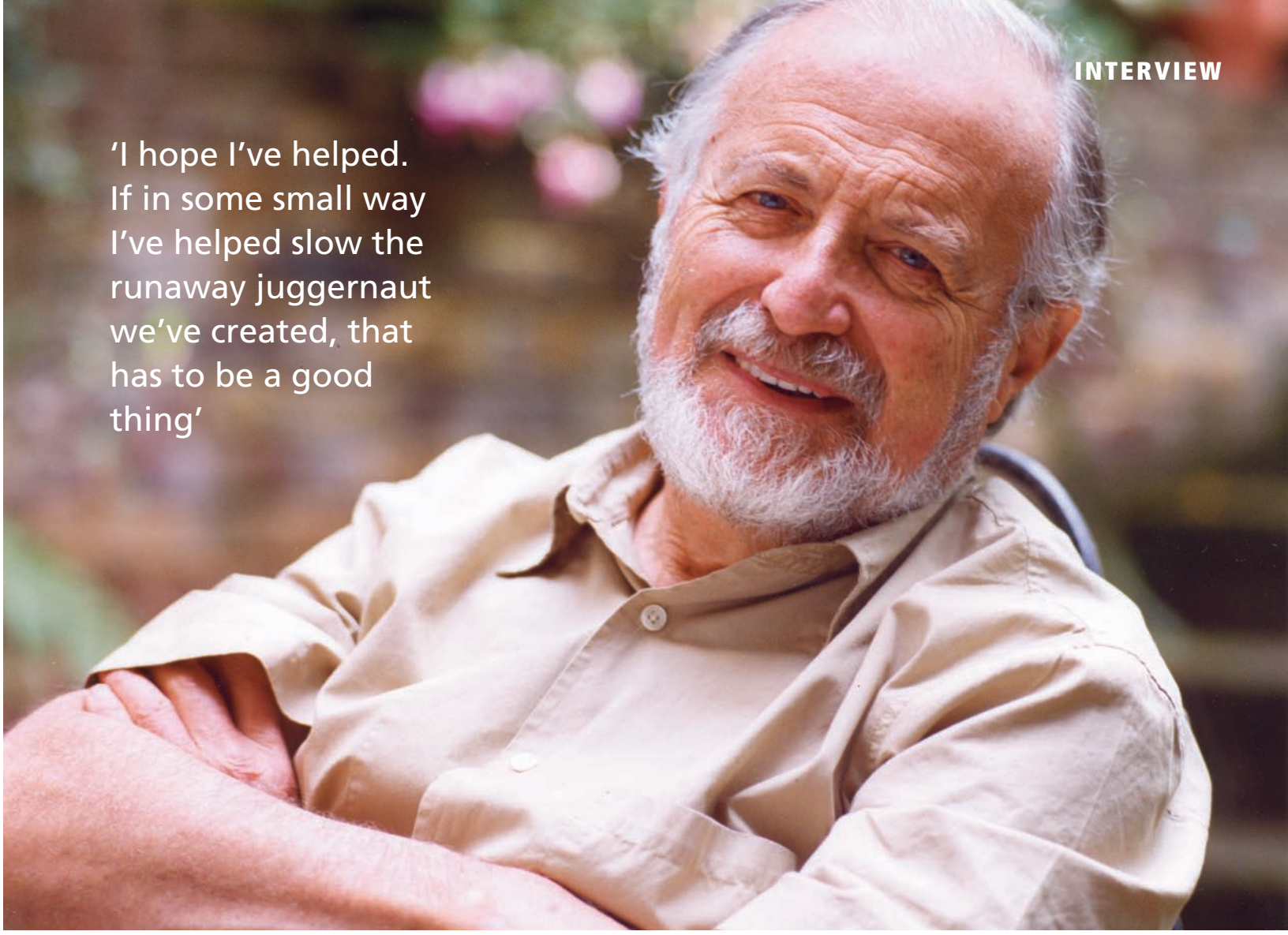
Meanwhile, he was at work on books of his own – *The Great U-Turn*, *The Way* and countless others – all of which hung on the one, central idea that had (and has) not changed in Teddy's thinking for 50 years: that small-scale, 'traditional societies' are the only ones that work, and that humanity needs to return to such a way of life if it is to have a future.

Teddy's adherence to this notion has cost him friends and allies as the green movement has moved gradually away from it – and him – during his lifetime. A bit of historical context explains why. The early green movement had a wide variety of adherents and founders, from former communists to nationalists, and even a few notoriously far-right sympathisers. The early greens aimed to be 'beyond left and right', to transcend not just contemporary political divisions, but industrial society itself.

Nature, they pointed out, is neither left nor right wing, and whether you sided with Adam Smith or Karl Marx on how to divide up the economic cake was beside the point if the cake itself was poisonous. The job of the greens was to question 'development' and economic growth, and create a new, wider political context.

Conservatives might focus on the nation state as a political unit, socialists might want to unite the workers of the world – but for the greens, the primary political unit was the planet itself, and its constituents were not just the humans who occupied it, but all its other forms of life too.

Time, and the realities of politics, have watered down this vision. Today's leading Greens are almost all drawn from the political left. They speak the language of 'social justice' and 'multiculturalism', and are anxious to trumpet their 'progressive' principles. In this context, Teddy



Goldsmith's stubbornly small-c conservative vision, and his commitment to 'stability', 'tradition' and the teachings of ancient religions are red rags to a green bull.

Also infuriating for others has been his insistence on talking to anyone who will listen to him, regardless of their politics. In 1997 this cost him his fellow *Ecologist* editors, who resigned after Teddy had addressed a group of far-right European politicians. They accused him of giving unnecessary succour to the far-right's attempts to co-opt green ideas. Teddy observed he had recently toured Switzerland at the invitation of a Trotskyist group without censure, but the damage had been done.

Perhaps he should take comfort from the impressive range of insults that have been thrown at him over the years. He has been called 'an extreme right-wing ideologue' (by Dutch Stalinist Eric Krebbers, who disliked Teddy so much that he invented the word 'fascistoid' especially for him), a 'Bolshevik' (French magazine *l'Actuel*), a 'wacko-communist-liberal' (viewer of the US C-Span TV network) a 'Jacobin terrorist' (US writer Lyndon Larouche), an 'enemy of the state' (President Suharto of Indonesia), a 'Gaian-sociobiologist' (Wolfgang Sachs), a 'madman' (Professor Lewis Wolpert) and even, allegedly at any rate, 'the anti-Christ' (the Catholic Archbishop of Bologna).

It's an impressive list, and anyone who accumulates such a wide range of venomous barbs can be sure of two things: firstly, they are having an impact; and secondly, their ideas are hard to fit into easy categories.

Teddy Goldsmith certainly isn't easy to pin down. He is full of loathing for industrial society, yet is determined to save it from itself. He believes it's too late to prevent climate change, yet has dedicated years to trying to do just that. Listen to him holding forth on the wonders of 'traditional societies', the importance of taboo, or the value of religion and you'd take him for a died-in-the-wool Tory. But ask him his views on third world debt (cancel it all immediately), direct action (we need more of it), or global capitalism (foremost critic for four decades) and it's another story.

It would be hard to forge such an effective 40-year career without accumulating some contradictions, though. In the end, what matters is what Teddy Goldsmith has achieved. Perhaps history will be the judge of that. The man himself, when asked what his greatest achievement is, is strangely modest. He lists a few of his books, complains that they haven't sold enough copies, changes his mind and then, after a while, lands on a typically modest answer.

'I don't know what I have achieved', he says. 'I hope I've helped. If in some small way I've helped to slow the runaway juggernaut that we've created, or make people aware of it, that has to be a good thing. I hope I have done that.'

***Paul Kingsnorth is a former deputy editor of the* Ecologist**

Unnoticed by most of the media, New Labour has embarked on a roadbuilding scheme just as large as the one the Tories bragged was 'the biggest since the Romans'. All over the UK, however, ordinary people have noticed, and everyone – from doctors and teachers, to old-style road protestors – is once again saying: enough is enough. **Paul Kingsnorth** reports

Time blurs the memory. It was 10 years ago now, but I can't quite remember where. I can remember the small, thin birch tree, and the ring of yellow-jacketed security men that surrounded it. I can remember the size of the great, snorting bulldozer that threatened it; its oily pistons and the greasy smoke it belched into the woodland air. I remember running for the tree and scaling it, clinging on perhaps three-quarters of the way up, perhaps 10 foot off the ground.

I recall thinking how under-prepared I was, and how I should have brought a lock with me and how the trunk was too small for that anyway; almost too small to hold my weight. I could feel it sway under me as I clung on.

Finally, I can remember two yellowjackets approaching me and, without much effort, dragging me from the tree. I remember them manhandling me back towards the arm-linked lines of their colleagues, as the bulldozer snorted again and churned up the ground, its last obstacle removed. I remember thinking how we had lost here. But I remember thinking that we were winning, too.

This happened in one of the many camps along the route of the Newbury bypass, while that road was being constructed. It must have been sometime in 1996. And I can remember similar experiences in different landscapes from the same period: the period of the great boom in destructive roadbuilding across Britain, and the great boom in direct-action resistance that went with it. There had never been anything like this before, and there never would be again.

Or so we thought.

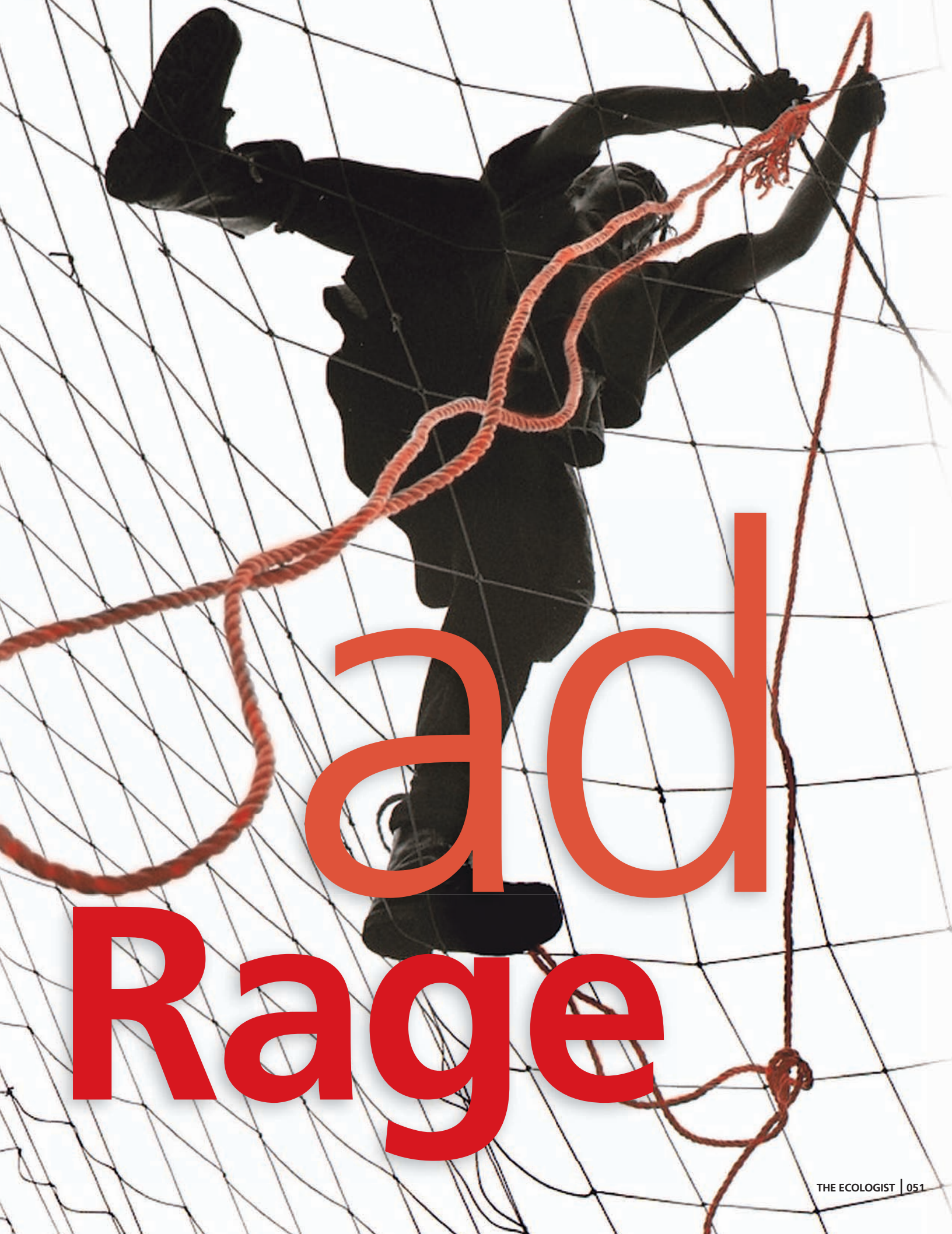
I can remember the sight of the sunrise over the Iron Age beauty of Twyford Down; a sight that no human will ever see again, because the Down is no longer there. It is now the M3 extension. I recall the combined fear and wonder I felt in the treehouse camps at Solsbury Hill; where we tried, and failed, to prevent the construction of the Batheaston bypass. Wonder at what this ragged band of rebels had achieved; fear because I didn't know how well they'd achieved it, or how strong the ropes were.

I can remember the vast nets strung out across entire streets, between the roofs of old Victorian terraces in East London, where whole neighbourhoods seceded from the United Kingdom and declared their independence in a bid to prevent the construction of the M11 link road. I can remember the planning meetings in squatted factories, the purchase of D-locks from bicycle shops, the passion, the fear, the loathing, the lack of sleep, the smell of dreadlocks in the morning. It seems like another world. It was.

I know I'm getting old because these days, I speak to young, fiery, university-age environmentalists and they don't remember

Ten years ago, scenes such as this hit the headlines. Today the government may have changed, but, angered at Blair's massive roadbuilding schemes, the road protesters are back. This time, some of their methods have changed; and they're not on the front pages of national newspapers. But they're winning

ALEX MACNAUGHTON



ad Rage

Top Gear presenter and symbolic hate figure for the road protest movement Jeremy Clarkson gets pied while receiving an honorary degree from Oxford Brookes.

ADRIAN ARBIB; ROAD BLOCK (X3)

the road protests that swept the country in the mid-1990s. Back then I was a young, fiery, university-age environmentalist myself and I was part of a national movement to prevent the destruction of some of the best landscape in the country by the Tory government's national roadbuilding programme. It was, the government had unwisely boasted, 'the biggest roadbuilding programme since the Romans', and the sheer destructiveness of it has since become legend.

In order to provide for projected traffic growth in coming decades, the government had decided to embark on a massive, unprecedented construction programme. It would build 2,700 miles of new roads – doubling trunk road capacity – including 150 new bypasses. They would plough through hundreds of scheduled ancient monuments, areas of outstanding natural beauty, sites of special scientific interest, nature reserves and many more special and valued places that did not have official designations. They would encourage increasing car use and contribute further to climate change, congestion and localised air pollution.

> These groups are not nimbies. They see themselves as part of a wider movement against climate change and for sustainability

The programme was necessary, said the government, because road traffic had been forecast to rise sharply in coming decades, and its duty was to provide enough 'capacity' for it. This flawed system of transport planning, known as 'predict and provide', came into sharp focus as opposition to the new roads spread from a few hardcore greens to society at large: by 1994, *The Economist* could observe that 'protesting about new roads has become that rarest of British phenomena, a truly populist movement drawing supporters from all walks of life.'

Questions began to be asked: is it remotely possible to build enough new roads to meet

forecast demand? Even if it were, would it be desirable? Would it not be better, for the environment and for society, if efforts focused instead on restricting the demand for car use, and promoting alternatives – not just walking, cycling and public transport, but actually reducing both the need and desire to travel so much, so often, in so many vehicles?

By the middle of the 1990s, the combined pressure of the protests, popular discontent and the increasingly obvious practical impossibility of building its way out of a growing transport problem had the government on the back foot. Add to that a number of major academic studies showing conclusively that building new roads, far from reducing congestion, actually created more, as new journeys were taken to fill them – and the writing was on the wall. The government caved in. Its road programme was dead.

Come 1997, and the Brave New Dawn of New Labour, the seal looked like being put on an exciting U-turn in transport policy. Transport secretary John Prescott announced a 'New Deal for Transport', which scrapped more than 100 of the Tories' planned road schemes. Labour, he said, accepted that roadbuilding didn't work. It destroyed precious landscapes, alienated communities, ran roughshod over local democracy, contributed to climate change and failed even in its primary purpose, to reduce local congestion.

Labour would instead 'reduce and then reverse traffic growth', he said – adding, famously, that 'I will have failed if in five years' time there are not many more people using public transport and far fewer journeys by car.' 2000 was the first year since 1954 when no motorways were under construction in Britain. It seemed that things were looking up.

And so the remaining protesters went home; battered but, in the end, victorious. We knew we had lost every battle we had fought – but that, as a result, we had won the war. We knew it could never happen again.

Which just shows how wrong you can be.

'I call it A350-ville,' says Jenny Raggett. 'It's the first major town to be named after a road.'

Jenny, who lives in Wiltshire, has been campaigning for years against the expansion of the A350, a previously inoffensive trunk road that is now, she says, becoming a kind of stealth motorway.

'Five towns around here are due for a lot more housebuilding, to meet government targets,' she explains. 'They'll get several thousand houses each. Most of them will be

ROADS TO SUCCESS

It can be done! These are just a few of the road schemes that have been seen off recently by intelligent, well-organised local opposition

High and Low Newton bypass The government proposed to build a £22m, 3.8km dual carriageway bypass on the A590 in Cumbria, around the hamlet of High and Low Newton. The A590 is an important link road between Barrow-in-Furness and the M6. Pro-bypass campaigners claimed that it would make the road safer and increase the economic prosperity of the region. The proposed line of the bypass cut through a swathe of open countryside within the Lake District National Park.

The charity Friends of the Lake District had long argued that a bypass was not the solution. 'There was no evidence linking it to economic prosperity. As for fewer fatalities, we argued that it was speed that killed, and campaigned for a reduction in the speed limit on the road through High and Low Newton. Since implementation of a 40mph speed limit in 2001 there have been no fatal accidents in the speed limit zone.'

Friends of the Lake District: www.fld.org.uk

M6 Expressway Dropped by the government last summer, after vigorous campaigning by the local Group Against Motorway Expansion (GAME). The 51-mile toll motorway would have cost £3.5 billion and sliced through several beauty spots.

Salisbury bypass Also dropped last summer, this road proposal had been fought locally for years. The road would have damaged stunning watermeadows around Salisbury Cathedral.

St Austell-A30 Link Road Cornish coalition People Against the A30 Link (PAAL) ran a campaign that successfully derailed this destructive proposal.

Camelford bypass Camelford Alternatives for Transport (CAT) put paid to this Cornish road, which would have destroyed a Special Area of Conservation (SAC), a major wildlife site, and several Sites of Special Scientific Interest.


Proposed route of High and Low Newton bypass

A47 Acle Straight Dualling this A-road through the Norfolk Broads National Park would have been pointlessly destructive. Local campaigners remain alert in case it is sneaked back into the roadbuilding programme.

Mottram-Tintwistle bypass The picture shows the popular Mottram Horse Fair. The dual carriageway of the bypass on the A628/A57 in Longdendale would have cut straight across here from west to east: from the play area on the left to the woodland on the right. One road would have continued east through the trees and countryside until it entered the Peak District National Park. A second new road would have swept south downhill to meet the A57.


Mottram-Tintwistle bypass route


M6 Expressway route

Main picture above: Opponents of the A628 Mottram-Tintwistle bypass on a guided walk. Right: Local campaigners hold a 'tree dressing' on an ancient road it would intersect.

sited in car-dependent estates on the outskirts. At the same time, all these towns will get new bypasses, which will have the effect of creating big new settlements, dependent on car transport, which are linked by what are in effect motorways. Meanwhile, train services here are actually being cut back, and buses are terrible outside the big towns. It's right back to the bad old days: roads to riches, roads to progress … it's as if the 1990s never happened.'

Jenny has a point. Two bypasses have been built on the A350 already, and more are on the cards, of which the most notorious is the planned Westbury bypass. Looking at the computer simulations that have been drawn up by planners envisioning what this road will look like, I am taken right back to Twyford Down. A great, grey slew of tarmac cuts a shear through virgin countryside, butting up against Salisbury Plain, slashing through an old drove road, undercutting White Horse Hill, filling the air around the edge of the Downs with the roar of heavy goods vehicles and cutting off a great area of green space – effectively enclosing it within the town's boundaries, where it will undoubtedly be 'infilled' soon enough with more houses, warehouses or car parks.

The government says that 2,500 miles of new carriageway will be 'needed' by 2025

As in the 1990s, this road is an environmental disaster waiting to happen. As in the 1990s, it is unpopular with local opinion, 75 per cent of which rejects it. As in the 1990s, it will ultimately fail to alleviate congestion anyway, as the road fills up with new cars over the next few years.

But this is no isolated case, for the policy wheel has come full circle over the past decade, and roadbuilding is firmly back in fashion. Today, almost 200 new road schemes are on the cards – four times as many as in 1997. The government says that 2,500 miles of new carriageway is 'needed' by 2025. £12 billion has been committed to roads already underway or imminent – part of the forecast £60 billion cost of putting all these new plans into operation.

Read the list of what is to happen, and it's like going back in time. It's as if nothing has changed at all since the 1980s – or perhaps even the 1960s. Sixty-three miles of the M25 widened to four lanes in each direction, at an estimated cost of £1.6bn. The M6 to be widened through Staffordshire and Cheshire. The Westbury bypass. A Hastings bypass – previously scrapped by Prescott, due to the sheer scale of its environmental destruction. The Mottram-Tintwistle bypass, carving through

SEAN KELLY; ROAD BLOCK (X5)

the Peak District National Park. The Lancaster bypass. The Carlisle Western bypass. Large sections of the M1, M74, M4 and M60 to be widened to four lanes in each direction. The Weymouth 'relief road', slashing through the ancient Ridgeway and virgin countryside. The A3 Hindhead 'improvement', with twin road tunnels to be drilled underneath local landmark the Devils' Punchbowl.

The list goes on; a litany of the dashed hopes of a once-young government, and an environmental movement that had hoped for better. Dashed by the power of the roadbuilding and driving lobbies, and their supporters in the right-wing media; dashed by the expense and difficulty of providing alternative modes of transport; dashed by fuel protests and powerful business lobby groups like the CBI; dashed by the British public's unending love affair with its cars.

Essentially, the government gave up. It decided that it was too difficult to get people out of their cars – instead, like the Tories before it, it would focus on 'relieving congestion' by building new roads and appeasing drivers. The figures speak for themselves. Between 1997 and 2005, the real cost of motoring actually declined by nine per cent, while bus and coach fares increased by an average of one per cent, and rail fares increased by five per cent. Meanwhile, traffic levels on the roads continued rising. They grew by 81 per cent between 1980 and 2005, and are forecast to grow to 40 per cent above today's levels by 2025.

New Labour's initial optimism on roads and car use can, in retrospect, be seen as a historical blip. We have now returned to the sort of government we have had for the past half-century, whichever party was in power. Namely, a short-termist one that aims to build its way out of the country's transport problems by constructing more roads; and which, by doing so, actually makes the problem worse – because the trouble with aiming to relieve congestion in this way is that it doesn't work, even on its own terms.

More than a decade ago, a government-commissioned report first introduced the concept of 'induced traffic'. In a nutshell, it was shown – and has been shown since, in dozens of separate studies – that building more roads does not reduce congestion; it creates more of it. When drivers see new or improved roads, they assume their journey will be easier. They are thus more likely to make it, and the end result is that traffic on the roads increases, congestion increases – and more roads are built to alleviate it.

If you want the best example, look at the Newbury bypass. After all the battles that were fought to save nine miles of stunning countryside from its layers of concrete and asphalt, traffic on the road, which opened in 1998, is already higher than the government forecast it to be by 2010. Meanwhile, peak-time congestion within the town is back to pre-bypass levels. Such experiences are

Above: Campaigners against the Heysham M6 link, Lancaster, form a 'human road'. Right: Anti-road campaigners from Norfolk, Bedfordshire, Hertfordshire and Essex demonstrate at a 'hush-hush' meeting on 27 January 2006 to decide 10-year regional transport priorities

repeated everywhere a new road is built. The lesson is stark, simple, and long-learned. In fact, it is probably worth italicising: *building more roads doesn't work*.

When we add climate change into the equation, it becomes even clearer that there is no case for new roadbuilding at all. We hear a lot about the impact of cheap flights on the climate, and it's true that aviation is the fastest-growing contributor to climate change, currently accounting for 5.5 per cent of all the UK's CO_2 emissions. Leave international flights out of the picture, though, as the government does when it tots up the country's CO_2 emissions, and you find that a remarkable 95 per cent of all the UK's transport-related CO_2 emissions come from road traffic.

Those road traffic emissions increased by 51 per cent between 1990 and 2004, and the government itself accepts that traffic growth will result in a further 19 million tonnes of them this decade alone. It seems certain that this will add enormously to the amounts of CO_2 emitted by the nation as a whole in coming years. The government suggests that all the new roads put together will add only another 1.5 tonnes of carbon to our total, but is based on some highly optimistic forecasts on biofuel use and is, suggest some experts, barely worth the computer it was calculated on. The reality is likely to be much higher.

In 1993, seven protesters against the M3 extension through Twyford Down were jailed for four months for breaking an injunction banning them from the site. It was the first time environmental protesters had ever been jailed in Britain, and the case became a cause celebre. The prisoners received 100 letters a day from supporters, and a visit from the EU Environment Commissioner. The M3 extension became even more unpopular.

Rebecca Lush was one of the Twyford Seven. When Labour came to power, she thought her years of campaigning against new roads were over. These days, she is busier than ever. Lush is coordinator of RoadBlock, a national alliance of anti-roads groups she set up in 2005 to address the reborn threat. Her recent activities include chaining herself to a bulldozer on the site of the proposed Linslade bypass, and shoving a pie in the face of Jeremy Clarkson. She is one of the most effective environmentalists working in Britain today – a one-woman crusade against destructive roads. And she is not happy.

> The government admits that traffic growth will result in 19 million extra tonnes of CO_2 over the next decade

'There is a similar length of roadbuilding going on every year as there was ten years ago', she says. '"Predict and provide" is alive and well, and the government is completely sidestepping the crucial point – that we need to reduce our car use and reduce road traffic levels. They used to say that, but it didn't last long. Now they say they'll tackle road traffic emissions by promoting biofuels and drawing up voluntary agreements with car manufacturers to make engines more efficient. Even if they do this, and it works, it'll be vastly outstripped by traffic growth.'

The government, says Lush, would much rather talk about techno-fixes to reduce emissions than address the real issue – reducing car use. It is encouraged in this by some mainstream green NGOs, which talk much more about biofuels than they do about roadbuilding.

'The fact remains,' she says, 'that if you want to prevent climate change – not to mention more local environmental destruction around the country – the battleground is traffic growth. Yet we're spending billions on utterly futile roadbuilding. Imagine what would happen if we pumped that money into public transport, promoting cycling and walking … we could really start to have an impact.'

The question, surely, is why more people haven't noticed what's happening. Yes, Rebecca Lush has. Yes, Friends of the Earth still talk about roads, and the venerable Transport 2000 still bangs the drum for a sensible transport policy. But that's what

ROAD BLOCK (X3)

people like that do. You expect it.

Why are we not seeing protests on the scale we did 10 years ago? Where are the Swampies, the treehouses and the tunnels? Why is roadbuilding not in the papers every day as it used to be? Given that we know more about climate change now than a decade ago, and that it is widely accepted as an urgent issue by governments everywhere, why is this national scandal not getting the attention it deserves?

There are two answers to this.

The first is that everything, these days, is much more complicated. In the good old days, the government would announce a nationwide roadbuilding scheme and get the Highways Agency and the Department of Transport to make it happen. They'd publish a big white paper with all the schemes listed in it, where they would go, what impacts there would be and what it would all cost.

This meant that everyone knew what was going on. It also meant that opponents had a clear target to aim at. Now it's not so straightforward. The government is still responsible for trunk roads (major 'A' roads and the like) and motorways, but many other road schemes have been farmed out to local authorities. Others are being built privately, and some are even privately owned. And this is before you even take into consideration the various different means of funding them. What you end up with is a horribly complex network of responsibility, wrapped up in an absurd web of acronyms that even the most dedicated researcher or campaigner has difficulty understanding. TPIs, LTPs, multi-modal studies, the CIF, the RFA… the end result is confusion and complexity.

This turns out to be rather convenient for the government, as Rebecca Lush points out. 'Everything is far more complex now, and whereas the Tories trumpeted their roadbuilding, Labour keeps quiet about it,' she says. 'The fact that they have farmed a lot of roads out to local authorities also allows them to say that it's being pushed by local demand, not central government, and so it's not their fault. It also allows them to be vague about the overall costs and the overall impact on the environment. But all this new complexity simply hides the fact that this government has a major national roadbuilding programme, which they are pushing, and we are paying for.'

The second answer is a more exciting one. While it is not receiving national attention, at the local level, people have noticed. It may not be in the papers much, but, all over the country, at grassroots level, something is stirring. There are already dozens of local organisations, and thousands of enthusiastic, determined, well-informed people, mobilising against new roads. And their numbers are growing.

If you were depressed by the list of new road schemes, then, try this list instead. The Save Swallows Wood Campaign, in the Peak District, is mobilising hundreds of people to ward off the threat of the A628 Mottram-Tintwistle bypass. The No M1 Widening Campaign, a coalition of local groups along the length of the motorway, was set up by a local GP concerned about the effects of air pollution in the local area; it has since become a national force.

The local campaign against the Lancaster northern bypass has harnessed some of the best stunts and photo-opportunities around, to make a powerful case against the road. Significant, noisy and increasingly effective local campaigns are up and running to oppose the Kingskerswell bypass (Devon), the A14 Ellington to Fen Ditton road (Huntingdonshire), the A120 Braintree bypass (Essex), the M6 widening, the M74 extension (Glasgow), the Weymouth relief road (Dorset), the Hastings bypass…

In other words, there is hope in the dark. Roadbuilding may have returned with a vengeance – but so, it seems, has road protesting. It may take a different form from its previous incarnation, but it is, according to Rebecca Lush at least, just as effective.

'These groups are not "nimbies",' she says. 'They see themselves as part of a wider movement against climate change and for sustainability. In a way, they are often more effective than we were in the 1990s. They have certainly got the government sitting up and taking notice.'

Back in Wiltshire, Jenny Raggett, who is part of a noisy and growing campaign against the Westbury bypass route, says she's not giving up until this government, like the last one, is forced to change its ways.

'It can be hard', she says, 'to watch the same old mistakes being made. But I am convinced that it's grassroots action that is going to see off schemes like this. We all know it's happened before – and that means it can happen again.'

Paul Kingsnorth is the author of *One No, Many Yeses* (Free Press, £7.99)

HOW TO GET INVOLVED

Set up in 2005, Road Block is a national coalition of organisations fighting unnecessary new roads. It has been so successful – and necessary – that it recently merged with the longer-established transport campaign group Transport 2000. If you want to get involved in anti-roads work, or need help with a campaign in your area, these should be your first ports of call. The other resources listed below might also be useful.

Road Block
The Road Block website has links to local groups and a current list of campaigns around the country that need your help.
Tel: 020 7729 6973;
www.roadblock.org.uk

Transport 2000
Tel: 020 7613 0743;
www.transport2000.org.uk

Friends of the Earth transport campaign
Tel: 020 7490 1555;
www.foe.org.uk/campaigns/transport

Road Alert!
Venerable campaigning website with very useful resources
www.roadalert.org.uk

Sustrans
Sustainable transport charity
Tel: 0845 113 0065;
www.sustrans.org.uk

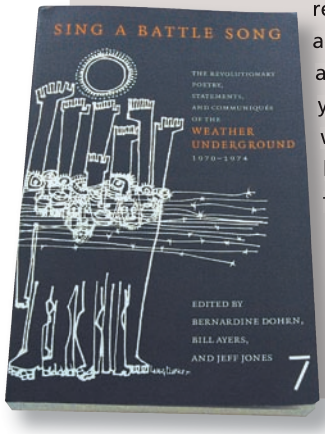
reviews RECOMMENDED BOOKS

SING A BATTLE SONG

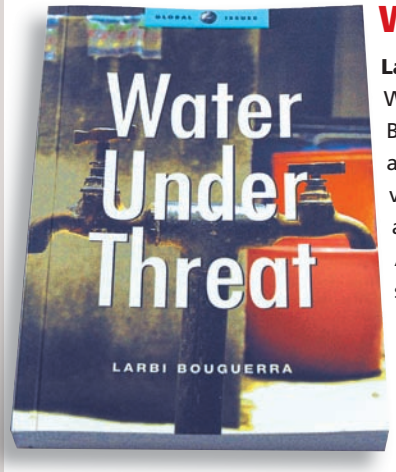
THE REVOLUTIONARY POETRY, STATEMENTS AND COMMUNIQUÉS OF THE WEATHER UNDERGROUND

Edited by Bernardine Dohrn, Bill Ayers and Jeff Jones, Seven Stories Press, £10.99

Governments who fight wars abroad rely not so much upon support at home as upon apathy. They rely on the public getting angry, going on TV, writing books and articles in magazines, but generally leaving it there. But what happens when people stop talking and start taking matters into their own hands? In the 1970s, appalled at what was happening in Vietnam, a group of radical students known as the Weathermen decided to 'bring the war home' and embarked upon a series of seemingly polar opposites – bombings (of symbolic properties) and poems. For the first time, *Sing a Battle Song* collects together the Weathermen's poems, statements and communiqués. Much of the material seems naturally dated, although the passion and rationale remains clear and powerful, and has never had more relevance in the intervening time. At a time of unparalleled US global domination and aggression, the reflections of these activists on the activities of their youth and what they see happening across the world today, will inspire some and enrage others.



Reviewed by Mark Jonas



WATER UNDER THREAT

Larbi Bouguerra, Zed Books, £12.99

Water is as essential as air and, one would think, plentiful. But, as Bouguerra's chillingly essential read makes clear, access to it is shrinking fast. Water is increasingly being viewed by the world's most powerful corporations as a commodity they can control and profit from. From Africa to Bolivia, battles are fought over whether it should remain a public resource, or be bought and sold. Bouguerra makes it clear in this excellently argued book that it is simply too important to be reduced to one more item to be traded. Many say that the 21st century will be fought over water: this book explains why.

Reviewed by Mike Harrison

THE CALF'S WORLD

Kite's Nest Farm, DVD, £10

At Kite's Nest farm, calves are seen as individuals with distinct personalities and this fascinating documentary is an insight into their world. Running races, sunbathing and investigating rabbit holes, calves can be happy, energetic and playful, given the opportunity to roam freely and express their natural instincts. Sadly, this is not a fate shared by many calves in the UK, who are viewed merely as commodities, kept in confined spaces and separated from their mothers within days of being born. Even worse, in March 2006 the EU lifted the ban on British beef and cattle imports, paving the way for live calf exports (destined for veal farms in Europe) to resume. *The Calf's World* was made in direct response to this – and each sale of the DVD will go towards CIWF's campaign to stop it. www.kitesnest.co.uk

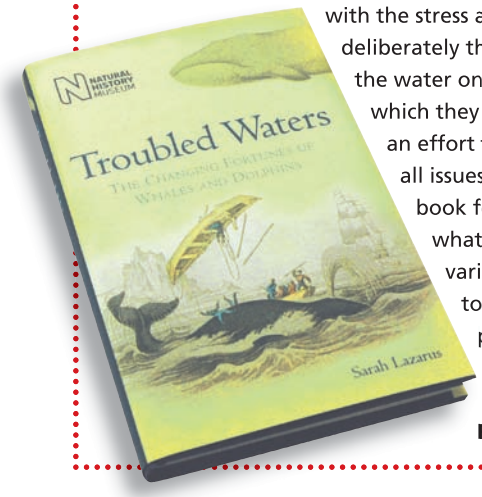
Reviewed by Laura Sevier

TROUBLED WATERS –
THE CHANGING FORTUNES OF WHALES AND DOLPHINS

Sarah Lazarus

Natural History Museum, £12.99

Considering the regard in which we profess to hold whales and dolphins, seeing them as the wise, compassionate kings and queens of the sea, the various ways in which we have brought about their demise are nothing short of staggering. Sarah Lazarus' calmly presented and honest account of the history of mankind's interaction with these most beautiful creatures takes us from the early whaling missions, through the issues of captive dolphins, discusses the threats whales face from manmade noise pollution, up to the never-ending disputes between countries such as Japan and Iceland and most of the rest of the world over commercial whaling today. Our endless hypocrisy rings throughout. We rightly chastise the Japanese for whaling, but see our 'need' to blast the oceans with sound equipment that can shatter the eardrums of whales, as somehow acceptable. We see contact with whales as therapeutic, as an opportunity to bond with nature. Yet killer whales in captivity need anti-ulcerant drugs to help them deal with the stress and have been known to deliberately throw themselves out of the water onto the side of the pools in which they are kept, presumably in an effort to commit suicide. As with all issues of man and nature, this book forces us to ask ourselves what it is we really want – the variety of the world's species to remain as intact as possible, or the maximum profit for man?

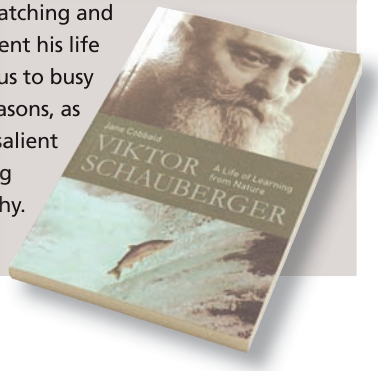


Reviewed by Richard Weston

VIKTOR SCHAUBERGER –
A LIFE OF LEARNING FROM NATURE

Jane Cobbald, Floris Books, £9.99

Schauberger was a visionary whose ideas were so far ahead of his time that they are still hard to comprehend now. Even attempting to summarise them in a short review would be next to meaningless. What is most important about the man, though, to which Cobbald's elegantly written biographical account of his life provides a wonderful introduction, is his belief that if we want to live with nature, we should spend time watching and learning from it. Schauberger spent his life doing just this, and for those of us to busy to notice the changing of the seasons, as much as anything this book is a salient reminder of the merits of slowing down, taking time and asking why.

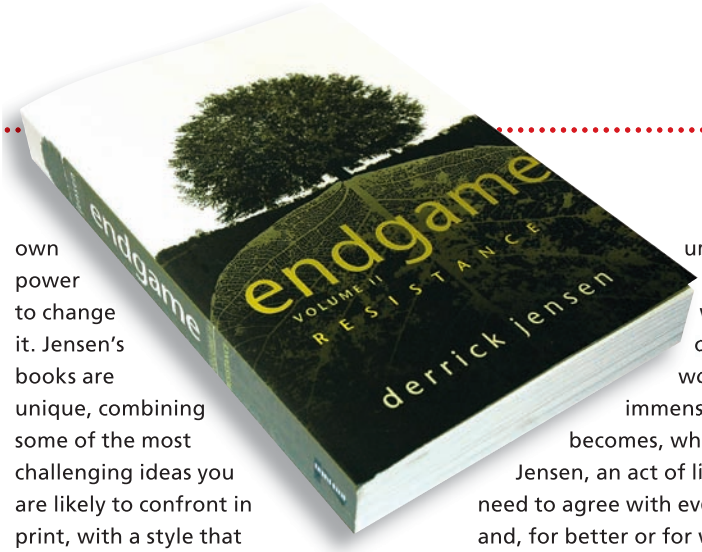


Reviewed by James Cousins

ENDGAME VOLUME 2: RESISTANCE

Derrick Jensen,

Seven Stories Press, £10.99

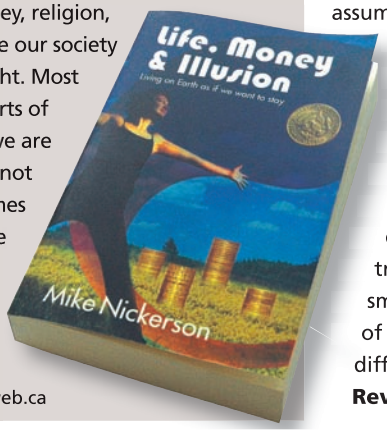


Having exposed what he sees as the problems at the root of civilisation in the first of this two-volume series, Jensen returns to say what he thinks we need to do about it. The answer is clear – resist. He has no time for those who sit around 'hoping' for change, which he sees as a serious abnegation of responsibility. To hope for something is to hope someone else will do it. For him, the only answer, if there is something going on that we disagree with, is to do whatever is in our own power to change it. Jensen's books are unique, combining some of the most challenging ideas you are likely to confront in print, with a style that swings between conversational and deeply erudite. Reading him is an education, one this reviewer is glad he's had on several occasions over the past few years. No stone remains unturned, no preconception unchallenged, no fight avoided. Yet what in the hands of a less gifted writer would be a heavy and immensely depressing read becomes, when approached by Jensen, an act of liberation. You don't need to agree with everything he says – and, for better or for worse, few will be as radical as he is – but for anyone who cares about the planet and wants to know why they should act and how, there are few more unflinchingly honest writers.

Reviewed by Jeremy Smith

LIFE, MONEY & ILLUSION – *LIVING ON EARTH AS IF WE WANT TO STAY*

Mike Nickerson, Seven Generations Publishing, $17.95 CAN*



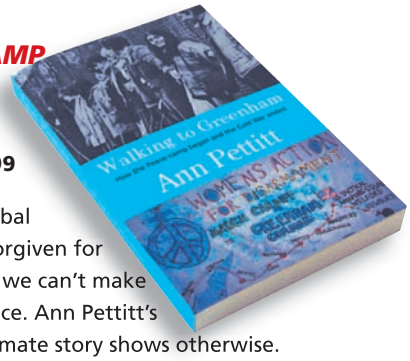
When we are children, writes Nickerson, we want to grow bigger. When we reach our optimum size, we stop growing. As adults, we then look to maintain ourselves healthily. Sadly, the same is not true of our economic structure. It is designed on the assumption that continued growth is the aim, regardless of how it might be supported. Nickerson's wise and readable book approaches this theme from many angles – biology, physics, money, religion, capitalism – interwoven into a narrative of where our society has gone wrong and how it might put things right. Most inspiring is the realisation that while it took efforts of extraordinary complexity to get us to the state we are now in, moving to a sustainable society involves not harder steps, but simpler ones. The difficulty comes not in what we will have to do, but in having the courage to stop doing what we are doing now.

Reviewed by Jeremy Smith

* Available direct from the publishers in Canada at £15 surface mail, £22 airmail. For more information, visit www.SustainWellBeing.net or email: sustain5@web.ca

WALKING TO GREENHAM – *HOW THE PEACE CAMP BEGAN AND THE COLD WAR ENDED*

Ann Pettitt, Honno, £8.99



In this time of massive, global challenges, we might be forgiven for assuming that individually we can't make much of a difference. Ann Pettitt's movingly told, intimate story shows otherwise. One day, this young mother living in rural Wales decided that enough was enough – and, fed up with the government of the day's nuclear policies, she and a few friends began to walk. Their walk ended up at Greenham, a UK airbase where American troops were stationed. More importantly though, their small protest grew into the most famous peace protest of modern times. For all of us desperate to make a difference, this is an inspiring read.

Reviewed by Richard Weston

green pages

Ethical fashion special

Sacking the sackcloth image

PHOTOGRAPH BY Matthew Eades

INSIDE

FIGHT CLIMATE CHANGE

Change where your electricity comes from.

If you thought climate change was too big a problem for you to tackle – think again. By changing to a supplier that produces electricity from renewable sources you are taking one of the biggest steps you can to help reduce carbon emissions and fight climate change. Switching is easy and takes only a few minutes. And we even match the standard price of each regional supplier. Change to Ecotricity and help change the way electricity is made.

WE'D LIKE YOU TO KNOW...

Burning fossil fuels to make electricity accounts for a third of the UK's carbon emissions.

Ecotricity invest more per customer in building new sources of renewable energy than any other UK supplier.

Last year our wind turbines saved an estimated 32,000 tonnes of CO2 emissions.[1]

Over the next twelve months we're planning to more than double our electricity generation with new wind power projects.

Call us free on

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ecotricity

[1] Based on BWEA and ASA figures of an emissions factor of 860g CO2/kWh for electricity generated by coal fired power stations, typically displaced by wind power generating capacity.

Contents

PLUS! ECOLOGIST READER OFFERS

Editorial

It's not every day that you see one of the world's supermodels wearing a sackcloth. But fashion has always helped to shape the zeitgeist. It was at the centre of the social and artistic liberation movements in the 1960s and '70s, it brought the power suit out of the boardroom in the 1980s and took streetwear out of the streets and onto the catwalks in the 1990s. It's only natural, then, that fashion in the early 21st century will express what's on the public's mind, and there is no doubt that green and ethical issues are at the forefront. But this time, in a reversal of roles, the fashion industry, which is more used to defining how the rest of us look, is being asked to look at itself. It's the consumers, and their thirst for more knowledge about the way clothes are made, who are initiating a dialogue with the industry. Estethica, the exhibition now in its second run at London Fashion Week, is dedicated to the fashion designers who have been the first to respond in this dialogue and are at the vanguard of refashioning the industry. It can be argued that their influence has already reached the top: from fashion magazines to high-street retailers, being green and being fashionable are no longer at odds. At last, ethical fashion is sacking its sackcloth image.

Sincerely,
Matilda Lee
Green Pages Editor
Email: greenpages@theecologist.org

COVER IMAGE
Model Lily Cole wears a sackcloth designed by From Somewhere
PHOTOGRAPHER
Matthew Eades
STYLIST
Claire Thiollier
MAKE-UP
Kay Montano using Dr Hauschka
HAIR
Peter Gray using Aveda
LEFT: Lily Cole wears a 'Save the Future' T-shirt designed by Katharine Hamnett for the Environmental Justice Foundation

MARCH

Spring into action: support Indian tea farmers, green your wardrobe, reduce your wattage, watch a lunar eclipse and go veg…

1-31 MARCH

VEGGIE MONTH

March is Animal Aid's annual promotion of vegetarianism – Veggie Month. It's ethical, healthy and easy to go veggie, and this month there are free food tastings around the UK. To find out more, tel: 01732 364546 or visit www.animalaid.org.uk. If you're stuck for ideas on what to cook, Animal Aid's free 'Go Veggie' pack includes wholesome, delicious recipes and nutritional advice.

SEASONAL RECIPE

ROAST LEEKS WITH MINT AND FETA

A savoury winter warmer that's mercifully fast and simple to put together

How to make (serves 3)

1. Take 1 kg of leeks; trim, wash and cut in half lengthways.

2. Lay them in an ovenproof dish, brush with olive oil and sprinkle on rock salt.

3. Pour 200ml of dry white wine into the bottom of the dish.

4. Cover with foil (or a lid) and cook at 220C (425°F, gas 7).

5. After 20 minutes, uncover and dot with cubed feta that has been tossed with some chopped fresh mint and Parmesan cheese.

6. Cook for another 20 minutes then serve with a carbohydrate-laden dish, eg baked potatoes.

Based on a recipe from* Vegetable Heaven *by Catherine Mason

2 MARCH

ACTIONAID 24-HOUR TEA AND COFFEE BREAK

The UK tea market is worth £66 million a year, but while profit for middlemen and retailers remains high, the tea farmers now receive only half as much as a decade ago. For a £1.70 packet of tea bags, an Indian tea farmer gets just 15p. You can help by holding a tea and coffee 'break' or other Fairtrade themed event, on Friday 2 March, during Fairtrade Fortnight. All proceeds go to ActionAid, whose campaigns support farmers living in poverty around the world. For a fundraising pack, phone 01460 238047, email coffee@actionaid.org.uk or visit www.actionaid.org.uk

3 MARCH

TOTAL ECLIPSE OF THE MOON

Total lunar eclipses are rare – the last was in October 2004. On 3 March, if you live anywhere in Europe, Africa, the Middle East or Western Russia, you'll be able to witness one. During a total lunar eclipse the moon usually turns a deep, dark red but in some atmospheric conditions it may even 'vanish' completely, giving the illusion of a 'dark moon'. In the UK, start to moon-gaze around 9.30pm to see a dark shadow on it. Between 10.44pm and 11.58pm, the eclipse will be total. Don't miss it: there won't be another until February 2008. For more information: www.eclipse.org.uk

HERB OF THE MONTH

PARSLEY

One of few herbs to grow well in early spring, parsley comes in two main varieties: flatleaf and curly. Flatleaf has a more robust taste than its curly-leaf sister, so it sautées well with other strong flavours, such as garlic and onion. Use parsley to enhance salads, soups, casseroles and sauces – and to boost your health. Rich in protein and vitamins A, B-complex, C and K, it has mild antibacterial properties and promotes healthy digestion.

7 MARCH

FASHIONING AN ETHICAL INDUSTRY CONFERENCE

The move towards a more ethical supply chain remains a huge challenge for the fashion world. How can the industry improve working conditions and source more ethically? At this London conference, speakers will include garment workers, major fashion companies and industry experts. For more information, tel: 0781 506 5028, visit www.fashioninganethicalindustry.org or email info@fashioninganethicalindustry.org

21 MARCH

SPRING EQUINOX

The spring, or vernal, equinox is a turning point in the year, when day and night are of equal length. In the northern hemisphere, it marks the end of winter and the beginning of spring. The sun crosses the celestial equator, bringing daylight to the North Pole and six months of darkness to the South Pole.

For many religions and cultures, the spring equinox signifies new beginnings. Sap rises, buds shoot, leaves appear on the trees and crops and flowers emerge. Pagans call the coming of spring Ostara (hence the word Easter) after the Teutonic fertility goddess Oestre, and ask that humans, animals and the fields will be fruitful in the coming year.

Above: buds of *Vitis riparia*, also known as the River Bank Grape or Frost Grape

11-18 MARCH

REAL NAPPY WEEK

Cloth nappies are easy to use, easy to clean, soft, secure, breathable and economical. And, considering that eight million disposable nappies go to landfill every day, they're better for the environment too. See page 94 for *The Ecologist*'s Cloth Nappy Trial Pack. For all you need to know about real nappies, call the Real Nappy Helpline, tel: 0845 850 0606 or visit www.realnappycampaign.com

23 MARCH

FAST FOOD NATION

The anti-junk food film adapted from Eric Schlosser's seminal 2001 book opens in the UK on 23 March. Director Richard Linklater has turned Schlosser's bestseller into a drama, and the effect is that while the detail is unavoidably glossed over, the impact of the global food system on individual human lives has never been clearer. See www.participate.net/fastfoodnation

25 MARCH

BRITISH 'SUMMER TIME' BEGINS

Set clocks forward an hour.

MARCH FOOD IN SEASON

FRUIT & VEGETABLES

- Broccoli (purple sprouting)
- Cabbages
- Carrots
- Cauliflower
- Chard
- Chicory and endive
- Leeks
- Lettuce
- Mint
- Nettles
- Parsley
- Radishes
- Rhubarb (forced)
- Seakale
- Sorrel
- Spinach
- Spring greens
- Spring onions
- Turnips
- Wild garlic

MEAT, POULTRY & GAME

- Rabbit
- Venison

CHEESE

- Ewe's milk cheeses

FISH

- Lobster
- Native oysters
- Wild salmon
- Sardines
- Scallops

ALL VEGETABLE PHOTOGRAPHS © www.thinkvegetables.co.uk/mwmack

PICK OF THE MONTH

ELECTRISAVE

'My new Electrisave tells me how much electricty I'm using, how much it's costing, how much CO_2 I'm causing to be emitted. Turn off a light and it drops. Run the washing machine and watch it soar. Suddenly my use of that most invisible of resources seems all too real, and I compete with myself to see how low I can make the reading fall. Perhaps I should get out more (after switching everything off, of course). See www.electrisave.co.uk'

Jeremy Smith

The Ethical Superstore is offering *Ecologist* readers £5 off Electrisaves (from £69.50 to £64. 50). Tel: 0845 009 9012 or order online at www.ethicalsuperstore.com

FAST FASHION

As our appetite for clothes, and in particular cheap clothes, increases, we're fuelling a trend for disposable fashion, something to be worn once or twice and then thrown away. With trends changing every four to six weeks, fashion has become as perishable as a food item. What does this mean?

Fast fashion

Where high street stores used to change their collections twice a year, the pressure is now on to have something new in store every month. Today's 'fast fashion' machine can churn out styles just six weeks after they appear on the catwalk. This trend has been made possible by the expansion of high street, low value retailers such as Primark and Matalan, and the growth of the supermarket clothing sector led by Tesco and Asda-Walmart, which sell clothing at around half the cost of the high street average. According to a recent report by the campaigning group Labour Behind the Label, one in four items of clothing bought in the UK comes from these four stores.

Stifling overseas clothing industries

Of the clothes that are recycled, the best quality are sold in charity shops, some are refashioned but most are shipped abroad to be resold at local markets. What are the implications of this? While it does create some employment, and provides low-cost clothing for people living in poverty, it raises concerns that the trade may be undermining the development of local textile and garment industries.

Not cherished, not repaired... sometimes not even worn

Where people once lived by the adage 'make do and mend', today that seems outdated and unnecessary. UK spending on garments was about £625 per capita in 2005, but only two per cent of this went to clothing cleaning, repair and hire. A survey of 2,000 people by Churchill Home Insurance found that, on average, women buy 14 items each year – such as jeans, blouses, skirts, dresses and shoes – which will never even be worn. Some people grew up with their grandmother's cherished sweater, or their mother's timeless dresses. What will we have to pass on to our children?

Cheaper

In the UK women's clothing prices have fallen by a third in 10 years. The low-cost retailer segment of the market is booming, doubling in size in just five years to snap up £6bn sales in 2005. We now buy 40 per cent of all our clothes at 'value' retailers, with just 17 per cent of our clothing budget.

Race to the bottom

Fast fashion specifically aims at a culture of rapid purchasing and disposal. Not made to last, clothes are produced with little care, using low-quality fabrics – so much so that one may be lucky to get a few wears out of them. As supermarkets sell jeans for as little as £3, the impacts of fast, cheap fashion are increasingly hitting those at the bottom of the supply chain.

Clogging up landfills

When we don't want them any more, 74 per cent of the clothes and textiles we throw away go to landfill – some 1.8 million tonnes of waste; another 13 per cent are incinerated and the other 13 per cent are recovered or recycled. While this represents less than one per cent of the UK's total waste, polymeric fibres do not readily degrade, landfills are decreasing in number and, because much of the clothes will be made from non-biodegradable fibres, they'll clog up landfill sites for years and years to come.

As we get richer, our waste increases, too – research has shown that a one per cent increase in disposable income results in a 0.5 per cent increase in waste.

More

As clothes get cheaper and cheaper, we're buying more than ever. UK consumers spent £38.4 billion on clothes in 2005. Between 2001 and 2005, the number of garments bought per person in the UK increased by over one-third. This is predicted to keep increasing: a report by DEFRA estimates a 90 per cent growth in the textile market between 2005 and 2020.

So, what have we gained from this trend? Fast, perishable, disposable fashion: badly made, barely worn and clogging up landfills or relegated to the back of wardrobes bloated with cheap clothes.

PHOTOGRAPH © ENVIRONMENTAL JUSTICE FOUNDATION

PHOTOGRAPH © KATE ESHELBY

GM

- **Genetically modified (GM) cotton now represents 30 per cent of total world production; it is grown especially in the USA, Australia, China and India.**
- **70 per cent of the USA's cotton is now GM.**
- **It is estimated that half of the world's cotton will be GM by 2010.[4]**

COTTON – it's natural, right?

Thanks, in part, to our love affair with T-shirts and jeans, cotton is the most used fibre in the world, with 65 per cent of the total apparel market. Conventially grown cotton is heavily reliant on chemicals that poison farmers, the soil and water. It's an iconic crop that symbolises the inequalities in the global trading system

Bad for farmers

- Cotton uses 22.5 per cent of the world's insecticides and 10 per cent of all pesticides, on only 2.5 per cent of agricultural land.
- Insecticide use leads to heavier and heavier spraying to prevent bugs returning.
- Each year at least 1 million farm workers worldwide are hospitalised from acute pesticide poisoning.
- Twenty thousand workers die every year from pesticide poisoning.
- Chlorpyrifos, an insecticide used in growing West African cotton, causes brain and foetal damage, impotence and sterility.
- Even in the regulated US market, seven of the 15 most used chemicals are 'possible', 'likely', 'probably' or 'known' human carcinogens.

Bad for the environment

- Soils exposed to chemicals absorb less rainwater, increasing the risk of damage and erosion. Crops become more vulnerable to drought and flooding and suffer reduced yields.
- Chemical exposure leads to reduced soil fertility, frequent water pollution and reduced biodiversity in or near the field; plus poisoned cattle, goats, poultry, cats and dogs.
- Three-quarters of all cotton is irrigated, leading to water management problems.

Unfair trading system

In the EU and the USA, cotton producers effectively receive prices two to three times higher because of the subsidies offered by governments. This allows inefficient farmers in Europe and the USA to go on producing cotton that is sold on the world market at a loss, bringing prices down for everyone. In the USA, 25,000 cotton farmers gain $3.5 billion in subsidies as part of President Bush's 2001 Farm Bill. In West Africa, where the cotton is cheaper to produce and of better quality, two million farmers get no subsidies at all.

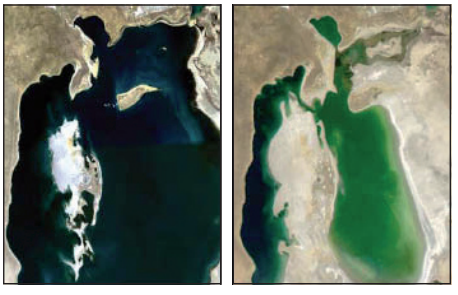
Uzbekistan: the crushing of a nation

A recent report by the Environmental Justice Foundation details the social exploitation and environmental catastrophe that cotton production has caused in Uzbekistan.

Diverting water to irrigate cotton crops has all but eradicated the Aral Sea – once the world's fourth largest inland body of water, now reduced to 15 per cent of its former volume. This has led to the disappearance of the sea's 24 species of native fish, the drying out of wetlands, and created tens of thousands of environmental refugees, as livelihoods centred around the Aral's rich fish stocks have been destroyed. The tragic irony is that up to 60 per cent of the water diverted from the Aral never reaches the cotton fields, as it is lost in the decaying irrigation network.

The three million agricultural workers who produce Uzbekistan's cotton work under the totalitarian dictatorship of President Islam Karimov. Working conditions include: strict quotas defining how much cotton they are to produce; wages administered via corrupt state banks; movement within and outside the country severely restricted, limiting people's ability to avoid the system or seek alternative livelihoods. The Karimov regime also conscripts tens of thousands of Uzbek children as young as seven, to help harvest the cotton.

Uzbekistan is the world's second largest cotton exporter, at 800,000 tonnes per year. Europe (the EU and Switzerland) is the biggest buyer.

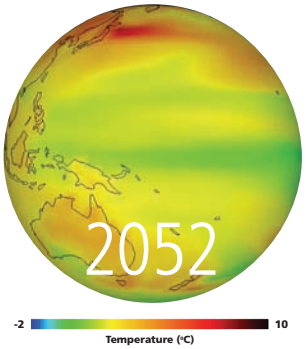


PHOTOGRAPH © NASA'S EARTH OBSERVATORY

Top left: Many Uzbek children are forced to pick cotton. **Top right:** African cotton farmers operate under an unfair global trading system. **Above:** Satellite image of the Aral Sea before and after being drained to irrigate cotton.

Changing Fashions **Changing Climate**

Climate change is the most important issue we face. The recent report issued by Sir Nicholas Stern made a case for urgent action to reduce our carbon emissions. We in Britain each cause on average 10.92 tonnes of carbon emissions a year – and clothing accounts for approximately one tonne (nine per cent)



By 2052 rising sea levels will lead to flooding in areas that provide cheap clothing, such as Bangladesh

How is clothing responsible for carbon emissions? There are four main reasons:

1. Farming

Conventional cotton farming is heavily reliant on petro-chemical fertilisers, pesticides and herbicides. Fertilisers are the largest source of carbon dioxide (CO_2) emissions in agriculture and the single largest source of nitrous oxide emissions for all sectors in the world.

2. High-energy manufacturing processes

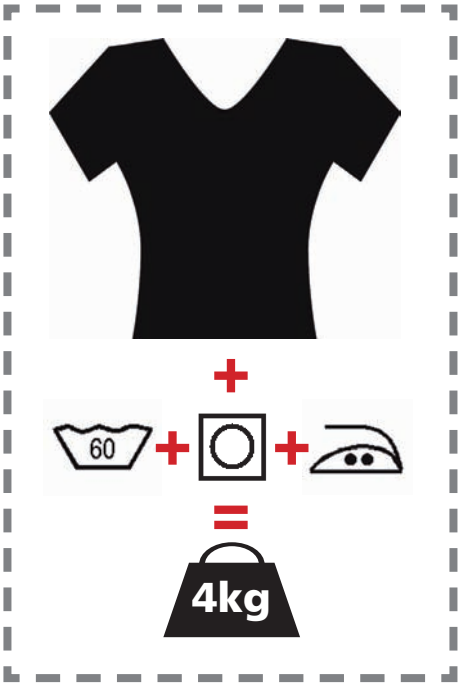
While the demand for natural fibres has been approximately constant, over the past 15 years the demand for man-made fibres has nearly doubled. The emissions from the chemical processes used to manufacture and finish garments, especially of man-made fibres, is very high. In the case of a blouse made from viscose, a cellulose-based man-made fibre, 65 per cent of its total 'cradle to grave' energy consumption takes place in the creation of the actual fabric.

3. Clothes miles

Today, clothing and textiles account for seven per cent of world exports. A skirt or dress may have travelled around the world once already before being purchased. From cotton field, to textile mill, to garment factory in Asia (the majority of textiles are manufactured in South-East Asia, China and India), each stage adds to the carbon emissions of maintaining our global clothing market.

4. The 'use' phase

Once bought, how an item of clothing is cared for and disposed of affects the weight of its carbon footprint. A typical T-shirt, if washed at 60C, tumble-dried and ironed, will lead to the release of 4kg of CO_2 in its 'lifetime' – the same as a 17 mile/27km aeroplane flight. Last year, some 450,000 T-shirts were sold in the UK – which, if treated as described, will result in the production of 1.8 million tonnes of CO_2 – more than the annual output of many African countries.



'The global garment workforce in 2007 is **tired, underpaid** and **unable to benefit** from globalisation.' Labour Behind the Label

Above: Women in Bangladesh sewing clothes for the West.
Right: The hands of a Bangladeshi child worker in a garment factory

Low pay, lack of rights and unacceptable working conditions are still the norm for millions of garment workers across the world

CASE STUDY
Profile of a garment worker
Lina from Dhaka, Bangladesh
Age: 22
Lina started working in a garment factory at 13. The eldest of eight children, she left home to find work after the family had to sell their land to pay for medicine for her sick brother.
Job: Sewing machine operator for a factory supplying the UK high streets
Working hours: 10 to 12 hours a day plus overtime (unpaid). Mostly she works seven days a week.
Pay: 2200tk (£17) per month. A living wage in Bangladesh is estimated at £22 per month.
Working conditions: 70 per cent of the workers at Lina's factory are women. Not only do they get paid less than men, they often suffer verbal and physical abuse and sexual harrassment by the managers, who are almost all male. There is no union and no way for workers to speak out about their problems.

Eco fabrics

Living in a material world needn't mean being so materialistic that we destroy it. Traditional methods and new technology offer textile alternatives

Organic cotton

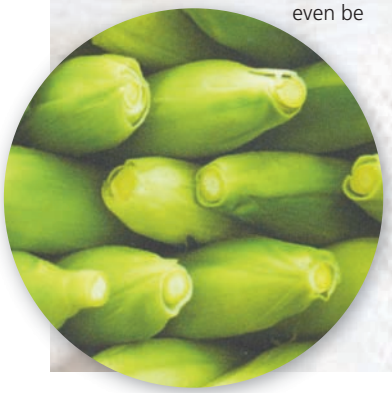
Organic cotton constitutes a major improvement on conventional cotton practices. The UK-based group Pesticides Action Network (PAN) has been involved in organic cotton farming projects in Africa since 1994, and has written extensively on its outstanding benefits, especially to poor small-scale farmers, in terms of improved health, income, livelihood and food security.

Organic cotton farmers typically receive a 20 per cent premium for their crop. Farming organically means healthier, stronger soils, increased farm biodiversity and less pollution of water and air. In many cases, organic cotton is grown with 100 per cent rain-fed agriculture, or using pioneering water management best practices. Organic cotton farming also empowers communities, encouraging co-operatives and unions and minimising the middlemen in the supply chain.

FABRICS FOR THE FUTURE

Cotton is a very water-hungry crop and can only be grown in specific climates – so its growth may risk clearing precious natural habitats to make room for it. For example, cotton production could explode in Brazil, but this would pose a potential threat to the country's rainforests. There is much research into other fabrics from natural, renewable sources, to replace non-degradable synthetics. Eco fabrics include:

Bast fibres Soft, woody fibres from stems such as hemp (above), flax and jute. Hemp, for example, is soft, comfortable, cool and hardwearing. It has a cleansing effect on the land, naturally suppresses weeds and requires few or no pesticides. Hemp can even be grown in the UK. The biggest bottleneck in its take-up as a fabric is the current inadequacy of processing techniques.



Ingeo Meaning 'Ingredients from the Earth'; made of corn (below) sugars, which are fermented and transformed into a polymer called polylactide. Made by NatureWorks LLC, Ingeo is now used in apparel and home furnishing fabrics.

Tencel Made from eucalyptus tree pulp that is dissolved in an environmentally-friendly, non-toxic solvent and made into a fibre.

Modal Considered to be a viable replacement for viscose, this is made from beech trees. Modal and Tencel are produced by Austrian-based company Lenzing. Both have higher yields than cotton, because the trees can grow in more compact environments, and need little treatment with pesticides.

Fairtrade Towards an ethical supply chain

From crop to clothes, the workers and their communities should benefit too

Fairtrade cotton

Fairtrade certification of cotton is currently helping more than 95,000 people – farmers, workers and their families – to improve their lives, as well as benefit their wider community. Under the Fairtrade system, farmers get a fair price for their product, with a 'Fairtrade premium' that is invested in their community.

CASE STUDY How Fairtrade helps to build a sustainable future

Indian cotton farmers in the Raspar region of Gujarat who are certified by Agrocal Pure and Fair Cotton Growers Association receive up to 37 per cent more from Fairtrade sales, compared with local market prices.

The purchase of cotton under Fairtrade practices means:

- increased earnings for rural families.
- migration back from cities to the villages.

The Fairtrade premium helps workers to:

- keep their children in school
- plant fruit trees as an alternative source of income
- improve rainwater conservation.

Top 10 tips for greening your wardrobe

Fashion's latest 'must have' is a social conscience. Becoming an eco diva is all about changing the way you shop and care for your clothes

1 Shop smart The number of garments bought per person in the UK increased by over one third between 2001 and 2005 – but many don't even get worn. A recent survey found that, over a lifetime, the items women buy but never wear amount to £12,810 worth of shoes and clothes per person.

2 Buy quality clothes made to last You may be lucky to get a few wears out of the fast fashion lining clothes racks nowadays. Classic, well-made clothes, on the other hand, stay in style season after season. The best indicators of a garment's overall quality are the quality of its fabric and the workmanship used to put it together.

3 Look for organic or eco fabrics Conventional cotton is grown using large amounts of pesticides, insecticides and synthetic fertilisers. Twenty thousand agricultural workers die from pesticide poisoning every year. Organic cotton and other eco fabrics offer a safer, more environmentally-friendly alternative. More than 80 brands, 110 retail stores and 150 online shops in the UK now sell organic fabrics. Visit www.wearorganic.org (run by the Pesticide Action Network UK) for a nationwide directory.

4 Say no to sweatshop labour Fairtrade-labelled products, member organisations of the International Fair Trade Association and companies using 'fair labour' have criteria for the working conditions and wages of the people producing their products.

5 Be a clothes connoisseur Vintage boutiques, dress agencies and charity shops sell designer labels, one-of-a-kind and rare garments – allowing you to kit yourself out in uniquely stylish outfits, often for a fraction of the cost of new clothes.

6 Wash green You can reduce the global climate-change impact of a cotton garment such as a T-shirt by 50 per cent.[3] Washing green means:

- Washing at lower temperatures: set the programme at 40C instead of 60C
- Air drying instead of tumble drying
- Ironing only when necessary
- Using eco-friendly washing detergents, with fewer or no phosphates.

7 Make do and mend Great clothes can stay that way with careful maintenance. Hemming, trimming and patching is easy and will give treasured clothes a new lease of life. Rips, holes or stains can be disguised with made-at-home corsages or appliqué motifs.

8 Do-it-yourself style Clothes that don't fit or are worn beyond use can be refashioned into something else and reused. Jeans can become denim skirts, sweaters can be transformed into handbags…and if all else fails, save them for a patchwork quilt.

9 Shop with a voice Retailers want to give consumers what they want – so tell them not to niche-market organic/ethical clothes while driving a race to the bottom in the mainstream market. And spread the message by asking for organic and ethical clothes in shops that don't yet stock them.

10 Join a campaigning group Support NGOs such as Pesticide Action Network (PAN), Organic Exchange, Oxfam and the Environmental Justice Foundation, who are working with farmers, retailers and governments to remake a more sustainable clothing industry.

A fully referenced version of the Ethical Fashion Special is available on www.theecologist.org

The designers

AGAIN NYC
www.againnyc.com

CHARMONE SHOES
www.charmoneshoes.com

CIEL
www.ciel.ltd.uk

DAVINA HAWTHORNE
www.cga.org.uk/davinahawthorne

DEL FORTE DENIM
www.delforte.com

ETHICAL FASHION FORUM
www.ethicalfashionforum.com

GARY HARVEY
www.garyharveycreative.com

ENAMORE
www.enamore.co.uk

FIFI BIJOUX
www.fifibijoux.com

JUNKY STYLING
www.junkystyling.co.uk

ENTERMODAL
www.entermodal.com

FROM SOMEWHERE
www.fromsomewhere.co.uk

KATHARINE HAMNETT
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The best of ethical fashion

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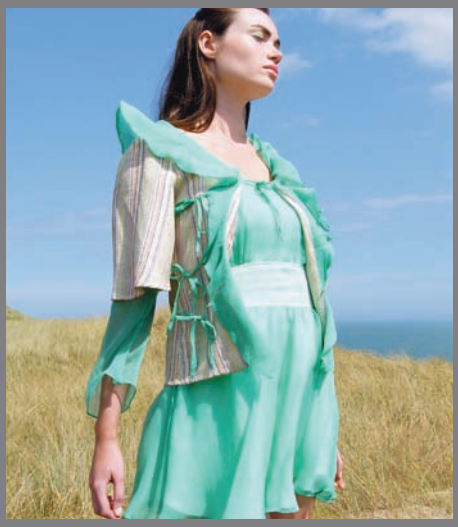

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www.mumo-uk.com

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www.terraplana.co.uk

WILDLIFE WORKS
www.wildlifeworks.co.uk

Don't know if you can hold your own in a dinner-party discussion about organic versus conventional wines? MONTY WALDIN dispels some myths…

WINE

TALKING ORGANIC

It's one thing to explain big issues such as nuclear versus renewable, or free versus fair trade. But organic wine? Here's some information to help you argue your organic-wine case…

Organic wine growers mean well, but sadly don't make very good wines

In fact, many of the world's most highly regarded ('blue chip') wineries are now adopting organic methods. They realise that using compost instead of weedkillers and fertilisers, and replacing systemic vine sprays with herbal teas, is better for vineyard soils. Great wines come only from the best soils, so polluting them makes no sense.

Where are the organic vineyards?

It's easiest to grow organically in dry, sunny places: think Mediterranean Europe, plus areas with continental climates (Austria, Germany), virtually all of Argentina, most of Australia, Chile, and California. Most organic bottles come from these places.

Should I look for wines from vineyards that have been independently (third party) certified organic or biodynamic?

Yes. It's the only way to guarantee that no weedkillers, chemical fertilisers or synthetic fungicide or pesticide sprays were used in the vineyard. Plenty of wineries are jumping on the green bandwagon without getting organic/biodynamic certification, meaning they can sneak in the odd non-organic spray.

Are organic wines more expensive?

That depends. At the cheaper end – say, less than £5 per bottle (the average selling price in the UK is £4), organic wine growers find it hard to compete, because they can't use weedkillers – a much cheaper form of weed removal than ploughing. However, there is little or no price difference once you reach £6 to £8 per bottle or more.

Do wines labelled organic still contain worrisome residues?

Organic/biodynamic vineyards avoid using the systemic chemicals allowed in conventional farming precisely because these sprays are designed to leave residues in vines and grapes. However, despite mandatory buffer zones set between organic vineyards and their conventional neighbours, in some cases it is impossible to stop the wind blowing some non-organic material into organic vineyards. However, levels are likely to be minimal; and if an organic certifier suspects spray drift is a consistent problem, a wider buffer zone may be voluntarily agreed, or enforced.

Why is copper allowed in organic sprays?

It's allowed in the anti-mildew spray Bordeaux Mixture (copper sulphate plus lime), deemed traditional by the organic rulemakers. Even scientists who oppose organics accept that copper residues are most likely to decompose in humus-rich soil – the bedrock of organic/biodynamic farming. Around 30 per cent of the world's organic wine growers (Argentina, California, Chile) don't use copper sprays; those that do must use up to 60 per cent less than conventional growers. Some European growers do not use copper at all.

Avoiding copper can mean switching to hybrid vine varieties (UK, Germany, Austria) that are 100 per cent *Vitis*. Hybrids generally need minimal spraying and produce palatable wines. Organic growers are at the forefront of switching to hybrid vines, and many promising disease-resistant hybrids have been bred in recent decades. Agri-business ignores this natural bounty in favour of genetically modifying vines, and GM companies have argued that a GM Cabernet Sauvignon wine should be labelled simply as 'Cabernet Sauvignon', even though it would not come from a 100 per cent Cabernet Sauvignon plant.

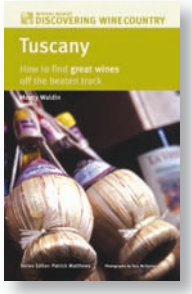
Are all wines labelled as organic suitable for vegetarians and vegans?

Not necessarily. The rules governing organic wine growing in Europe mainly focus on the vineyard, rather than the winery; and it is in the latter that animal-derived products can be used. Wine-making aids, called fining agents, include casein (milk protein) or isinglass (from fish) to make white wines look bright, or egg white and (animal-derived) gelatin in red wines to remove bitterness and make the wine taste smoother. Virtually all trace of the fining agent is removed before bottling. Wines labelled as 'vegetarian suitable' may have been fined with egg white (from organic eggs if the wine is organic), but not the other substances. Vegan-suitable wines use no animal-based fining.

Will organic cause less of a hangover?

Wines labelled 'made from organically grown grapes' should, under the rules in Europe, contain around 20 to 50 per cent less sulphites than those from conventional wineries; wines labelled 'organic' from the USA, Australia and New Zealand will contain no added sulphites (the term 'organic wine' does not legally exist in Europe, so to find sulphite-free wines you must read the back label). No one is sure, yet, if this plays a part in the 'hangover' effect; and no responsible writer on organics claims otherwise. But would you rather drink wines that allow the highest, or the lowest, levels of sulphites?

To order a copy of Monty's new book *Tuscany* at the special price of £9.75 (RRP £12.99) including post and packing, please call 01903 828503 and quote the code MB14.



Tasting Notes

Dry white – FRANCE
Domaine Pech-Roc – Sauvignon Blanc
Sauvignon Blanc can taste like cat's pee when grown in cooler climates, but in this example the warm, southern French climate ensures that the fruit flavours – gooseberry, grapefruit, even blackcurrant – are well rounded and not at all sharp. A well-structured wine with a hint of wild flower herbaceousness. Drink within six months of purchase.

Dry white – La Mancha, SPAIN
Camino Los Robles – Airén
This dry white comes from central Spain – Don Quixoté country. It is made from the Airén grape, which is a bit like France's Chardonnay: crispish, with medium body and a pleasant 'white winey' flavour. Cool fermentation and early bottling preserve the Airén's light melon and citrus flavours.

Dry white – Penedes, SPAIN
Can Vendrell – Chardonnay/Xarel.lo
This comes from one of Spain's best wineries – Albet i Noya (profiled previously in *The Ecologist*). The hallmark is consistent quality – not something for which Spain's wineries have been renowned. This dry white has some in-your-face tropical fruit flavours from the Chardonnay, plus a nice zip from the Xarel.lo – great if you're serving fish or white meat with a creamy sauce.

DRY REDS

La Coccinelle de la Grolet, Côtes de Bourg
This red has a lovely freshness and balance and is good to serve with food. Once opened, it will keep for a few days.

Aroa, Tempranillo
Soft, juicy enough to quaff on its own, unpretentious enough to be drunk with sticky fingers at a buffet.

Domaine de Majelus, Merlot
Smooth enough for everyday drinking, but with enough firmness and substance if you want to cellar it.

GREEN *FINGERS*

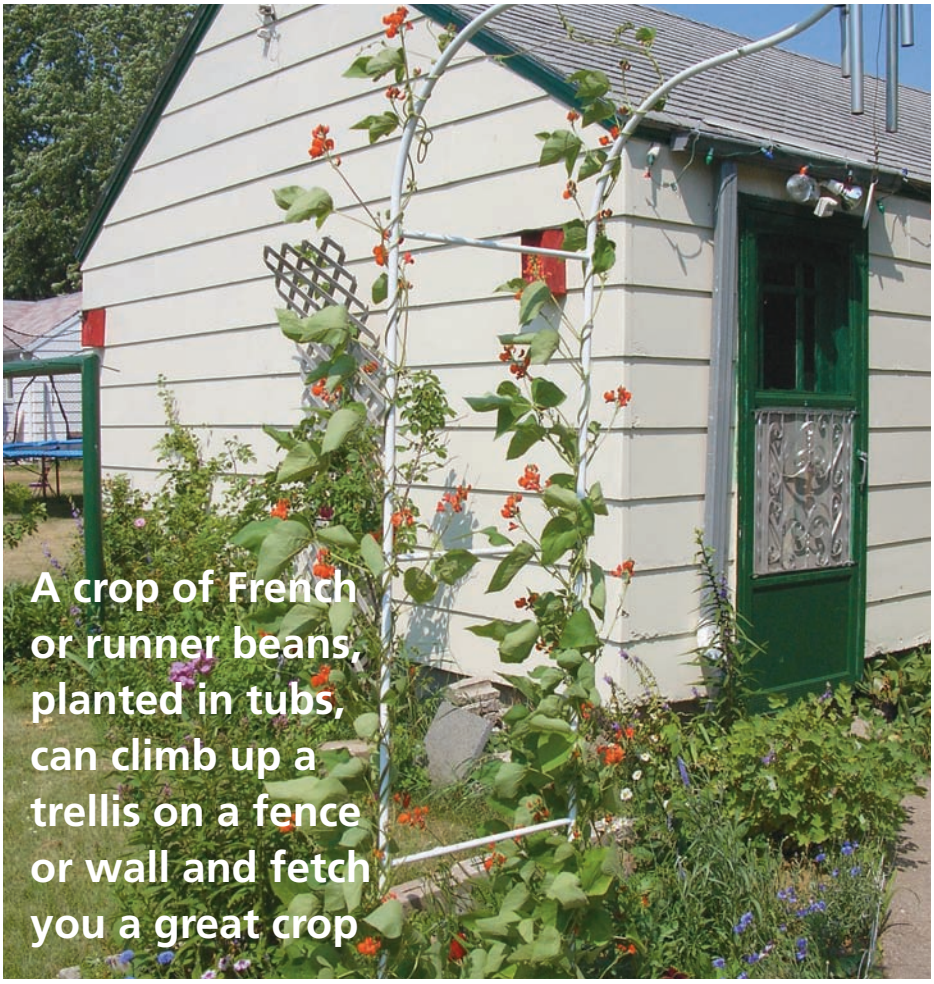
Paul Kingsnorth shares the potential of different shapes and sizes of containers for growing food – so let your imagination roam

Walking to my allotment a couple of weeks ago, I passed a house in which some serious DIY was going on. The front garden was strewn with the remains of a bathroom – smashed tiles, pipework, dusty old cupboards and the bath itself.

On top of these skeletal remains perched two toilet bowls; not broken, not smashed, not even chipped. In perfect condition, in fact. I pondered. Could I carry them? They looked heavy. But they obviously weren't wanted. And they could definitely come in handy.

I didn't salvage them, though, and I still sort of regret it. Not because my house is short of bathroom facilities, but because they would have a made a great feature on my allotment. I could picture them in the middle of my plot, full of soil, onion stalks or potato leaves poking from the top of the bowl. Laugh you may, but if I'd done it in the Tate Gallery I'd probably have the Turner Prize on my mantelpiece by now.

Last month's column explored how to grow your own food if you're flat-bound and landless. This month I'm moving up the scale a bit – though not a lot – to look at how you can feed yourself if you have little more than a tiny yard, or a small patch of concrete. In other words, if you don't actually have any soil.



A crop of French or runner beans, planted in tubs, can climb up a trellis on a fence or wall and fetch you a great crop

I'm sort of in this position myself. Our house has a small, urban back garden and though it has a couple of small borders, in which we grow herbs and wildflowers, there's nothing like enough space to grow any worthwhile amount of food. This is why I have an allotment. But if you can't get one, can't manage one or don't want one, there's no need to despair. Container gardening can still save you from the hideous netherworld of shrink-wrapped lettuces and Kenyan mangetout.

All you need is something in which to store enough soil to grow food – a pot, a bucket, a tub, even an old bath. Beyond that, space and patience are about the only limiting factors. Here are a few examples, all of which have been put into practice either by me or someone I know.

Salad pots Get down to the garden centre or your local hardware shop and source yourself a variety of different pots and tubs. Think about what you want to grow in them before you do. Get yourself a deep pot

Green peppers, French beans, strawberries, lettuce, courgettes: containers are great for food

and you can grow carrots, beetroot or even parsnips. Shallower soil but more surface area will let you grow lettuces, spring onions, or any herb you'd care to mention. A decent variety of containers and you've got yourself an entire salad.

Potato tyres Not the most attractive of options, but if appetite rather than aesthetics is your focus, it will serve you well. Pile up three or four old car tyres, fill them with soil and plant some seed potatoes in the top. Make sure the stacks get some sunlight, and keep them watered. The black tyres will absorb a lot of the sun's heat, and you should get a great yield of potatoes from little space. This method should also work for other root crops like carrots, parsnips or beetroot.

Trees in a tub A friend of mine found a large tin bucket in a skip, took it home and planted a young apple tree in it. According to latest reports, it's doing well. Planting fruit trees in a container is never going to be as effective as planting them in the ground, where they can spread their roots and breathe, but it can work if you have a big enough tub and a small enough variety of tree. Crab apples are ideal, as are compact dwarf apple or pear trees, which you can buy from most nurseries.

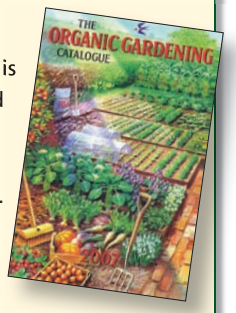
Strawberry Fields in planters Strawberries are a brilliant crop to grow in containers. They're dead easy to grow, need little expertise or effort, and don't require that much soil either. They'll grow in most containers, and you can buy specially-designed strawberry planters in all kinds of different designs, which will give you a picturesque cascade of luscious red berries on your patio come June.

Climbers and hangers There's no reason why your crops have to be at ground level. A crop of French or runner beans, planted in tubs, can climb up a trellis on a fence or wall and fetch you a great crop. Or you could build a pyramid of garden canes above the container and wind them up that – with the added benefit that it creates a beautiful garden feature when the flowers come out in early summer. And there are always hanging baskets: what's to stop you growing food in them? The sky's the limit.

Moreover, you can grow your crops in anything from stylish, shop-bought terracotta pots to old bathtubs salvaged from the dump. You can choose the look of your little garden just as you choose what you want to eat from it. Think laterally. You'll enjoy it.

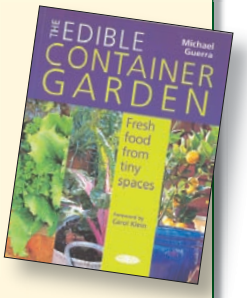
Email me: **paul@paulkingsnorth.net**

Useful resources



● *The Organic Gardening Catalogue* is a great resource – and it's free. Order seeds, tubs and tools from it as you plan for spring. Tel: 0845 130 1304 and they'll send you a copy, or sign up at www.organiccatalog.com

● Trees Direct can sell you miniature apple, crab apple, cherry and even peach trees for container growing. Tel: 01588 680 280 or visit www.treesdirect.co.uk



● *The Edible Container Garden: Fresh Food from Tiny Spaces*, by Michael Guerra (Gaia Books, £11.99) has received good reviews.

● If you don't fancy scavenging your containers, Crocus can sell you almost every variety under the sun. Visit www.crocus.co.uk

Suppression isn't cure

Our love affair with convenience culture extends to a reliance on convenience 'cures' for minor complaints. In the first article of a new series, *The Ecologist*'s Health Editor **Pat Thomas** says that self-medication isn't the same as self-help

Achieving 'good health' is one of the single biggest preoccupations in modern society. But if pressed, most of us would struggle to define exactly what 'good health' is. At a pinch, we would probably define it by the absence or of major or even minor debilities. Yet clearly, good health is more than this; for if it was simply a matter of a well-behaved body, how is it that some individuals – for instance those dying of cancer – often report feeling a profound sense of wellbeing?

Nevertheless, most of us now and again experience troublesome symptoms – such as headaches, insomnia, digestive problems, respiratory and skin troubles and being susceptible to every 'bug' that is going around – that we fight off in a bid to stay healthy. Vague health complaints are becoming increasingly common, and many of us now consider them part of the 'normal' human condition. Indeed it is clear that in spite of our increased longevity, a growing number of people in their prime report a lack of vitality and a variety of uncomfortable symptoms that they cannot pin down or get rid of.

> 'People are suffering from 'vertical ill health'; not sick enough to take to their beds but lacking essential vitality

According to US health expert Jeffrey Bland PhD, such people are suffering from 'vertical ill health'; not sick enough to take to their beds (and become horizontally ill) but lacking essential vitality and a sense of wellbeing.

While no one can expect to be symptom-free 100 per cent of the time, banishing these health niggles has become the mainstay of the £2 billion over-the-counter (OTC) drugs industry. During the past decade, more and more drugs have come off the prescription list and become available off the shelf to provide quick relief. The government's enthusiasm for self-medication has a single purpose: to relieve the pressure on overworked physicians who have little time for consultations and little to offer those suffering from chronic sub-clinical health complaints.

The trend for self-medication is actively sold to the public as a way of being in control of their own health, yet most people who self-medicate are just an extension of the GP or the pharmacist, practising the same magic bullet paradigm that causes ongoing health problems in the first place.

At least 95 per cent of illnesses are self-limiting. In other words, they will heal by themselves and do not require any intervention. In many cases, suppressing symptoms by taking an OTC medication can actually make things worse because it never really tackles the cause of the problem.

A more sensible approach recognises that many of the symptoms we often associate with illness are really the body's

The passionflower (*Passiflora*). One species, *P. incarnata*, is known for its healing properties, with a long history of use by Native Americans and others. It is used in homeopathy to relieve anxiety and related symptoms such as insomnia

attempts to get well and to regain a state of homeostasis, or balance. Good examples of this process abound in our experience of common conditions such as fever, coughs and inflammation. For example, fever is uncomfortable but it is not a disease process, it is the body's attempt to kill off invading bacteria and viruses. Coughing is not a disease process. It is the body's attempt to get rid of excess mucus. Inflammation in a joint or around a wound is the body's way of protecting the injured part while the process of repair takes place. Likewise, a skin rash is seldom a disease process but often the body's way of ridding itself of toxins (the skin is the major excretory organ in the body).

Unfortunately, in Western society today, most people get their information about their bodies and about health matters via the mass media, and the mass media has a lot to answer for in terms of the way we define wellness. First of all, our media suffers from an almost incurable disease itself – expert-itis. Whether writing about conventional medicine or alternatives, the media tendency is to ignore context and uncritically reproduce everything that any so-called health expert has to say. This can often led to the passing on of incomplete, contradictory or simply wrong information. It can also reinforce the idea that others know more about your health than you do and that your body is somehow… wrong. Few people are aware of the hidden agenda in most health reporting: of the multi-million-pound PR machinery that drip-feeds the media with self-serving information on the importance of drugs to relieve symptoms.

In this way we are educated about health and have learned that we must free ourselves from our troublesome bodies. So we wage war, buying more and more stuff – to try to quiet the body and make it behave, make it run full tilt 24/7 – and forgetting that prevention is perhaps the most important part of any cure. Indeed, studies suggest that healthy people consistently behave in ways that are conducive to good health. These include aiming for balanced nutrition, taking regular exercise, knowing when to take a break, not voluntarily poisoning the body with chemical toxins, pursuing spirituality, paying attention to and taking responsibility for their feelings and actions and by building and maintaining strong social support.

'Good health' is a very individual thing, the result of efforts in several directions at once

The conventional approach to healthcare also encourages the 'patient' to switch off and leave everything to the experts. Unfortunately it is very difficult to make sensible choices about your health when you are 'switched off'.

In the following months, our new health series will encourage readers to ditch the unnecessary drugs; to become confident in understanding and treating minor ailments by themselves in simple ways; and to understand how their bodies function and how they can work with the body rather than against it.

The truth is that 'good health' is a very individual thing. It is the result of efforts in several directions at once; it's also more of a journey than a destination. Nobody feels whole and content every part of every day. Indeed, some would go so far as to say that without illness, and the impact that it can have on our lives, good health has no meaning at all.

GET WELL SOON…

Of course, that's what we all want. But consider the following before you reach for the pills

● **BE INFORMED** Getting independent information on your condition and your choices for healing is vital. Wherever possible, get more than one opinion.

● **CONSIDER MORE THAN ONE APPROACH** A combination of more natural approaches rather than a combination of drugs may be effective. For instance, massage therapy such as Shiatsu can greatly enhance the balancing effects of nutritional or other biochemical approaches.

● **ASK 'WHAT'S IN IT?'** Refuse to be passive about the 'stuff' that you are taking or being offered. Always ask what's in a particular remedy, what each of the ingredients does and what you can expect from it.

● **GIVE IT TIME** Conventional medicine works, in the main, by suppressing symptoms. Complementary therapies work by addressing the cause and healing the whole body. This holistic process can take time and patience.

● **LESS IS MORE** The aim of any medicine should be to support the body's own ability to heal and change, not to undermine it or do all the work for it; so the 'hit it hard and fast' approach may not be appropriate. Studies into some herbs, for instance, have shown that larger amounts do not always produce better or faster results than small regular doses.

● **WORK WITH YOUR BODY** Have some faith that your body can do what it is supposed to. It can often tell you what is wrong – physically and emotionally – if you can listen to it. Before you reach for any remedy, or run to any practitioner – conventional or alternative – spend a while 'tuning in' to your real needs. Simply doing less may relieve stress-related symptoms.

MERIDIAN

ORGANIC

Organic Passata
2 excellent quality, traditional Italian Passatas, available in original and smooth.

Organic Pasta Sauces
4 new premium quality pasta sauces, with high Tomato content and no added water, starches, sugar or sweetener.

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New Label Design and New products from Meridian

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GREEN SHOPPING GUIDE

Make every £1 you spend count

READER OFFERS

82 10% off food and drink at The Natural Grocery Store

90 15% off Green Shoes' men's and women's ranges

92 25% off men's skincare from Primavera

94 15% off Aravore's baby blankets

94 Cloth nappy trial pack

FOOD & DRINK

ecologist READER OFFER

10% OFF

Food and drink

- Natural and organic groceries: bakery, biscuits, pasta, sauces, meat, fish, soup, seeds, herbs and spices
- Fairtrade
- Vegetarian and vegan
- Wheat-, gluten-, dairy- and sugar-free
- Tea, coffee, smoothies, juice, wine, beer, spirits, cider

PLUS

- Baby products
- Clothing
- Household
- Bodycare
- Supplements

THE STORY OF THE NATURAL GROCERY STORE

Co-founders Mike Fisher and Paul Lewis were travelling through the US and Far East in the early Nineties. They were inspired by the way natural foods were sold in America and Hong Kong. 'It was all very, very different from the rather worthy, dark and understocked "health shops" that you found in the UK,' says Paul. 'You could buy things other than dried chickpeas, for a start. We decided to take the plunge and start our own store. Somewhere light and airy like the stores in the States. Somewhere where the shelves were groaning with things people would want to eat, rather than little brown things in packets they thought they should eat…'

The Store, based in Cheltenham, opened its doors in 1998. They're currently kitting out a new warehouse in Andoversford. 'It's a mammoth task, but it means we'll soon be able to offer even keener prices because we'll be able to buy direct from more suppliers – and we'll be able to expand our range.'

Seventy per cent of their stock is organic and from local suppliers where possible. At the core of their philosophy is a belief that good, real food is life-enhancing as well as fundamental to health. 'Eating real food can remind you of how food should taste – without flavour enhancers and chemical colours, food simply tastes better.' Their eco policy is impressive and includes the use of biodegradable packing. 'We know they look like polystyrene chips, but they're actually made from cornstarch.'

HOW TO RECEIVE YOUR DISCOUNT

1. Log onto www.naturalgrocery.co.uk, scan the virtual shelves and fill your online shopping trolley.

2. At the checkout:

- **register your details**
- **in the comments box, write '*The Ecologist* Readers Offer'**

3. The discount will be issued as an electronic voucher: 10 per cent of the value of your first order* will be deducted from your second order

Web order enquiries: 01242 821 152

(* Exclusions from the 10 per cent discount will be all Alpro products, Whole Earth Baked Beans, all tobacco products and any existing specially priced item, eg. Special Offers page)

EAT REAL FOOD

Why not free yourself from the overly packaged, non-ripe, out of season and tasteless varieties of supermarket produce and visit one of the excellent online producers below? They will deliver their genuinely fresh, seasonal fruit, vegetables, fish and meat direct to your door. And you can feel safe in the knowledge that you're buying environmentally sound, locally sourced, delicious food that meets the highest animal welfare standards.

FRUIT & VEGETABLES

Do you live near a farmers' market? For a list of farmers' markets around the country, go to **www.theecologist.org/farmersmarket** Along with many greengrocers, farmers' markets are a great source for locally produced, fresh, seasonal fruit and veg. If, however, you don't live near a good greengrocer or farmers' market, the next best way to get your fruit and veg is to sign up for a local box scheme. For 15 reasons to join one, and a list of suppliers throughout the UK, go to **www.theecologist.org/boxscheme**

ORGANIC BEEF, LAMB, PORK & POULTRY

No local butcher? Reliant on heavily processed, packaged and factory-reared supermarket meat? Find out what meat should really taste like – order your next steak online . . .

Daylesford Organic
www.daylesfordorganic.com
Graig Farm Organics
www.graigfarm.co.uk
Helen Browning Organics www.helenbrowningorganics.co.uk
Higher Hacknell Farm
www.higherhacknell.co.uk
Sheepdrove Organic Farm
www.sheepdrove.com
Well Hung Meat
www.wellhungmeat.com

How can I be sure my meat will arrive fresh? Fresh meat and fish is carefully wrapped in insulated boxes with ice packs, ensuring that frozen goods stay frozen and chilled items stay chilled.

Experience your food!
■ Never shop in supermarkets
■ Buy local fresh food
■ Cook more
■ Grow food at home
■ Support the small, independent and ethical producers and retailers in these listings.

FRESH FISH

No local fishmonger? Want your omega-3 fatty acids without further endangering chronically depleted fish stocks? Have your sustainably caught/reared fish delivered to your door.

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www.organicsmokehouse.com
Deverill Trout Farm
www.purelyorganic.co.uk
Graig Farm Organics
www.graigfarm.co.uk
Loch Fyne
www.lochfyne.com

THE JOY OF HEMP

A wonder crop since 1993, when hemp cultivation was legalised in the UK, around 2,000 hectares of hemp have been grown every year. Hemp grows as a very thick canopy, suppressing weeds. Pests don't seem to bother it, so it is easy to grow organically. A hemp crop is ready to harvest in only 100 days and leaves the soil structure in better condition.

What does it taste like?
Hempseed oil has a pleasant mild nutty taste.

Try it:
• Hempseed oil for salads and cooking
• Hemp seeds sprinkled on soups, salads, cereals
• Hemp pasta and hemp pesto
• Motherhemp's Organic Dairy-Free Hemp Ice
• Hemp chocolate and hempseed bars

Hemp for health
No other plant source compares to hemp in its range and balance of nutritional benefits. Hemp seeds have fibre, protein and essential fatty acids (EFAs). Not only are EFA's vital for brain health, they also reduce the risk of cancer, heart disease, allergies, arthritis, eczema and infections.

Will I get high?
No. The Tetrahydrocannabinol (THC) level in hemp is too low to have any psychoactive effect.

Where can I buy it?
Mother Hemp
www.motherhemp.com
The Hemp Shop
www.thehempshop.co.uk

STORECUPBOARD ESSENTIALS

What could be more convenient than having all your cooking 'essentials' delivered to your door once a month...

Buxton Foods
www.buxtonfoods.com
Community Foods
www.communityfoods.co.uk
Graig Farm
www.graigfarm.co.uk
Goodness Direct
www.goodnessdirect.co.uk
Hider
www.hider-foods.co.uk
Meridian Foods
www.meridianfoods.co.uk
Naturally Good Food Ltd
www.goodfooddelivery.co.uk
Real Food Direct
www.realfooddirect.co.uk

ECOLOGIST ACTION FOOD-BUYING GROUPS

Club together with your friends to buy from these food wholesalers and save £££ on good, local, organic essentials

Clearspring
www.clearspring.co.uk
Community Foods
www.communityfoods.co.uk
Eostre
www.eostreorganics.co.uk
Essential Trading
www.essential-trading.coop
Organico
www.organico.co.uk
Suma
www.suma.co.uk

DRINK BEERS, ALES, CIDER & WINE

Beers in a Box
www.beersinabox.com
Black Isle Organic Beers
www.blackislebrewery.com
Broughton Ales
www.broughtonales.co.uk
Dunkerton's Cider and Perry
www.orchard-hive-and-vine.co.uk
Freedom Organic Beer
www.freedombeer.com
Festival Wines
www.festivalwines.co.uk
Pure Wine
www.purewine.co.uk
Vinceremos
www.vinceremos.co.uk
Vintage Roots
www.vintageroots.co.uk
Pennard Organic Wines & Cider
www.pennardorganicwines.co.uk
Sedlescombe Organic Vineyard
www.englishorganicwine.co.uk

SPIRITS

Juniper Green Organic Gin
www.junipergreen.org
Stonelink Farm (organic sloe gin)
www.stonelinkfarm.co.uk

COFFEE

A Lot of Coffee
www.alotofcoffee.co.uk
Café Direct
www.cafedirect.co.uk
Equal Exchange
www.equalexchange.com
Origin
www.origincoffee.co.uk
The Bean Shop
www.thebeanshop.com

TEA

Clipper Teas
www.clipper-teas.com
Hampstead Tea and Coffee Co
www.hampsteadtea.com
Eleven O'Clock Tea
www.rooiboschtea.com

ECO POWER CAMPAIGN

AIM To meet the UK's energy needs from local, clean, renewable sources

In the UK we need to move from our dependence on non-renewable, air-polluting, climate-changing, centrally generated, hugely inefficient and increasingly expensive sources of energy – gas (40 per cent), coal (30 per cent), nuclear (20 per cent), oil (five per cent) – to non-polluting, small-scale energy sources generated as close to users as possible, eg wind, hydro, tidal, solar, biofuels, ground source heat, etc.

HOW? Supplying the current (and expected increased) energy demand in the UK, while keeping prices for energy low, is IMPOSSIBLE. We either confront this and start to adapt, or we stick our heads in the sand and moan about the inexorable rise in our energy bills. Each one of us, starting at home and then moving out into our local communities and workplaces, needs to:

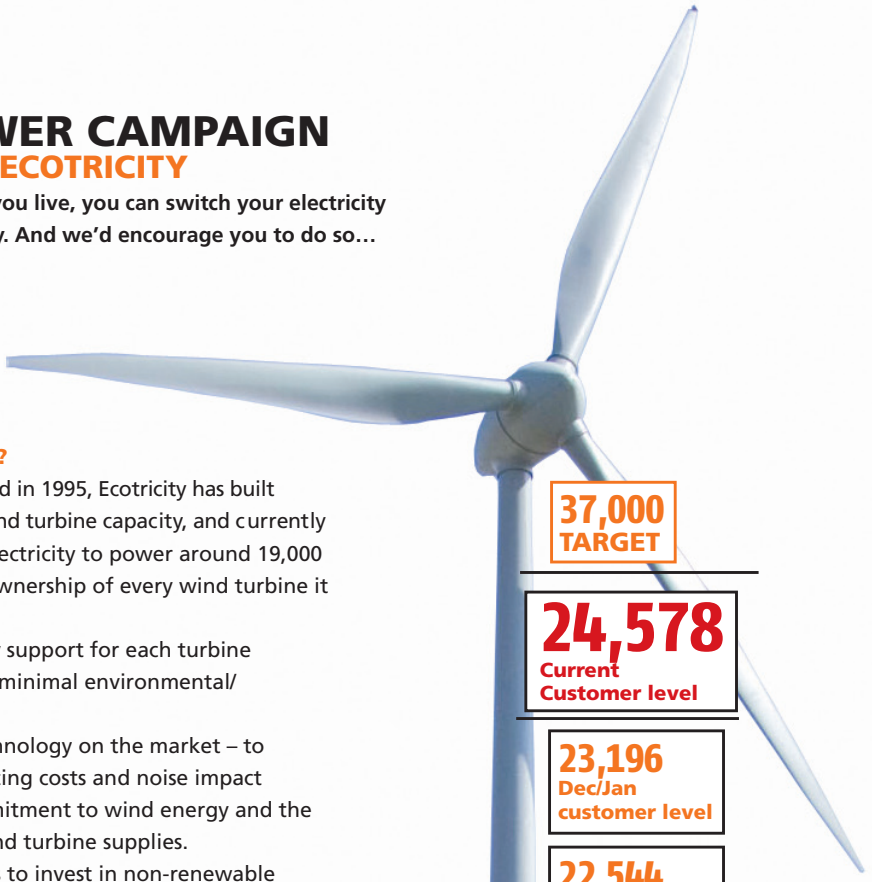
1 **SWITCH our energy SUPPLY to ECOTRICITY**
2 **REDUCE our energy DEMAND**
3 **LOCALISE our energy SUPPLY... individually, and in our communities.**

We can't wait for politicians to act, and can't rely on an energy market that profits from rising energy prices and increasing demand. This is why *The Ecologist* and Ecotricity have teamed up to ease your transition from expensive, centrally supplied energy to clean, locally supplied energy at home (and at work). Our combined research and practical expertise will ensure that the options we recommend for reducing demand and generating your own supply will work without costing you a fortune.

ECO-POWER CAMPAIGN

SWITCH TO ECOTRICITY

No matter where you live, you can switch your electricity supply to Ecotricity. And we'd encourage you to do so...



WHY ECOTRICITY?

Since it was founded in 1995, Ecotricity has built 26.3MW of new wind turbine capacity, and currently supplies enough electricity to power around 19,000 homes. It retains ownership of every wind turbine it erects, ensuring:

- Total community support for each turbine
- Optimal siting – minimal environmental/ community impact
- Best turbine technology on the market – to minimise its operating costs and noise impact
- Long-term commitment to wind energy and the community the wind turbine supplies.

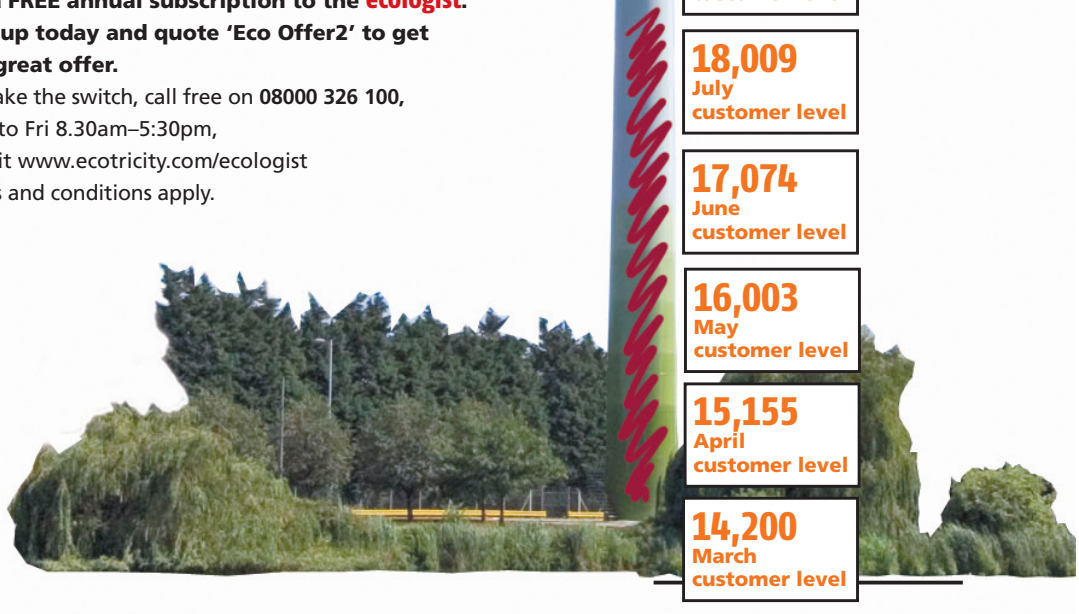
Ecotricity refuses to invest in non-renewable energy sources, eg coal, gas or nuclear power.

WHY SWITCH NOW?

For 2007, Ecotricity has approval to build 27 new turbines, totalling 30MW of clean energy – enough to power 20,000 more homes. All it needs is as many of us to buy our electricity through the company – thereby giving it the financial leverage to put this additional renewable capacity in place. Together we can fill the gap threatened by nuclear and coal decommissioning while the grey suits in Westminster fiddle.

Switch your electricity to Ecotricity today and get a FREE annual subscription to the ecologist. Sign up today and quote 'Eco Offer2' to get this great offer.

To make the switch, call free on **08000 326 100,** Mon to Fri 8.30am–5:30pm, or visit www.ecotricity.com/ecologist
Terms and conditions apply.



The European Ecolabel is Europe's official green label. Run by Defra in the UK, you'll find its flower logo on a growing range of quality products which are independently certified to meet high environmental standards. To find out more, and to see a full list of ecolabelled products, visit www.defra.gov.uk/environment/consumerprod/ecolabel

defra
Department for Environment Food and Rural Affairs

HOME ENERGY

ELECTRICITY

RENEWABLE ENERGY TECHNOLOGIES
(wind, hydro, solar PV)
Dulas Ltd
www.renewable-resources.com
HiTech Energy Ltd
www.hitechenergy.co.uk
British Eco
www.britisheco.com
LIGHT BULBS
Energy Saving World
www.energysavingworld.co.uk
Energy Savers Direct
www.energysavers-direct.com
Nigel's Eco Store
www.theinsightecostore.com
SUPPLIERS
Ecotricity
www.ecotricity.co.uk

GROUND SOURCE HEAT PUMPS

Conservation Engineering Ltd
www.heating-designs.co.uk
Eco Heat Pumps

ECOEVENT

THE OUTDOORS SHOW

16-18 March NEC Birmingham
Feeling adventurous? Need to get out more ? Get inspired about all things active at the Ordnance Survey Outdoors Show and find out how much Britain's countryside has to offer for hikers and cyclists, from coastal paths to highlands hills. Book tickets online: www.

ecologist READER OFFER

GREEN SHOES

15% OFF ALL ADULT FOOTWEAR

Green Shoes is a group of six women in Devon who make shoes and fashion accessories by hand. The energy requirements of their workshop are low, packaging and waste are kept to a minimum and efforts are made to source materials from suppliers within the UK. Working by hand, they can combine traditional skills with the best contemporary design.

Three reasons to wear Green Shoes

- You get to choose the exact shape and colour from a range of styles evolved during more than 20 years' experience.
- Unlike most modern footwear, Green Shoes can be resoled and repaired
- Wearing Green Shoes is more than a fashion statement. It is a refusal to endorse the global system of mass-produced brand name shoe manufacture.

www.greenshoes.co.uk

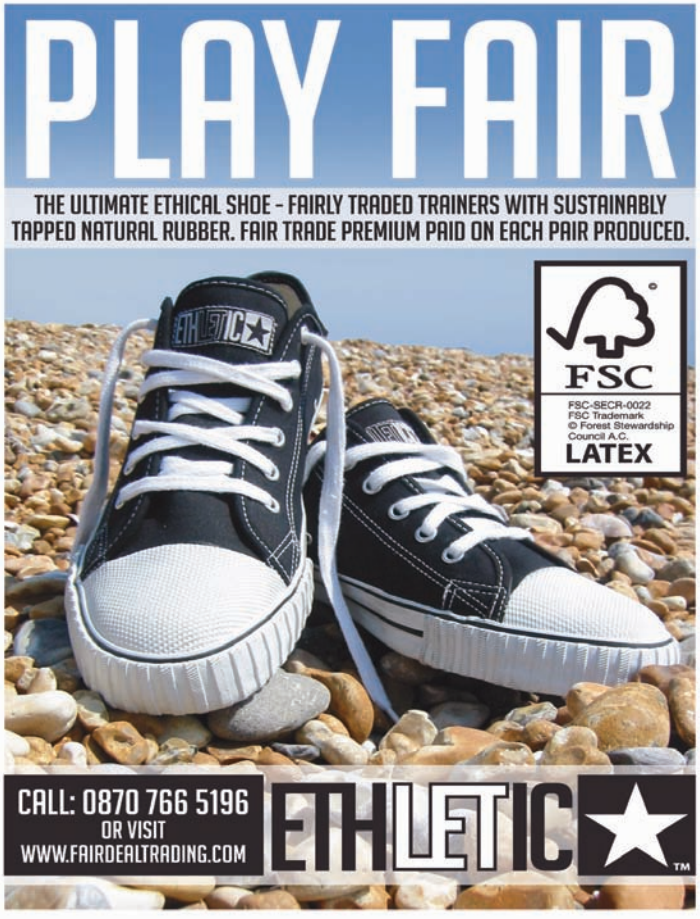
TO ORDER: Phone 01364 644036, quoting '*Ecologist* Reader Offer'. Offer valid until 1 May 2007.

Ethical fashion boutique **ecobtq** was launched in July 2006 and has so far been featured on **Hippyshopper**, **Treehugger**, **The Guardian's Green Guide** and **The Ecologist** magazine.

ecobtq is a boutique that cares about where it's purchases come from. Our customers want to look stylish but at no cost to the world around us. We want to support designers who are challenging fashion and create a platform to promote them. We have created a boutique where you can find innovative design and desirable fashion made from sustainable resources.

Designers currently featured are: **CIEL** womenswear, **CIEL** Bath and Body range (right), **VINTAGE** jewellery, **ROSIE WEISENCRANTZ** jewellery (above), **TRAID** shopper, **THE MOHAIR WOOL SCARF ENTERPRISE** (main picture), **TING** accessories and **ORINOCO** womenswear

Visit www.ecobtq.com or tel: 07966 369 499



DON'T PANIC – IT'S ORGANIC

Natural bodycare and cosmetic products are just as effective as their conventional counterparts but, because they don't rely on plastics, synthetic colours and chemical preservatives, you will find that their range, application and usage can be different. Here's what to bear in mind when using natural products:

Natural cosmetics

• Lip glosses are safer than lipsticks because they contain less potentially-toxic colour, but they won't last as long, because they don't contain plastics and film formers.
• Mascaras won't dry as quickly, lengthen or be waterproof like conventional mascaras because they don't contain synthetic fibres or ingredients such as plastics.
• Eyeshadows will come in a more limited range of 'earth' colours because they will be based on a palette of mineral and plant dyes.
• Choose cream blush instead of powder blushers, to avoid potentially cancer-causing talc.
• Avoid sparkly make-up, which can contain ecologically unsound mica.

Natural bodycare products

• Choose moisturisers based on single oils (plant or animal based) rather than complex mixtures of oil, water, preservatives and film-forming ingredients. These may feel more oily on your skin at first but will be fully absorbed fairly quickly.
• Natural toothpastes should be fluoride-free and won't foam as much as conventional ones because they won't contain detergents such as sodium lauryl sulphate.

ecologist READER OFFER

PRIMAVERA AROMATHERAPY

25% OFF MEN'S RANGE

Natural skincare products made from purest plant-based ingredients free from sulphates, parabens and chemical preservatives.

Anti-irritant shaving cream
A nourishing, moisturising, non-foaming cream to leave skin healthy and invigorated. Active ingredients include macadamia oil, squalane and linseed elements, selected for their mild, nurturing, anti-irritant effects to prevent any razor burn or dryness.

Men's anti-oxidant serum
A synergistic blend of natural vitamin E, *Centella Asiatica* and Hawaiian Seaweed create a soothing, skin-protecting aftershave finish. This light-textured serum improves health, firmness and vitality of the skin. Natural vitamin E and White Tea extract provide anti-oxidant protection; Monostroma seaweed, rich in amino acids, has lifting and anti-ageing effects.

Men's anti-age moisturiser
A light, easily absorbed, nourishing cream containing soothing Calendula, especially beneficial for dry skin and helps repair damage from shaving. Protects against environmental pollution irritation. Highly active plant ingredients such as Mimosa Tenuiflora regenerate tired skin cells, while Centella Asiatica helps reduce wrinkles.

Primavera Aromatherapy
Anna Gwilt, Primavera's founder spent 30 years as a registered naturopath, osteopath and aromatherapist. Established in 1986, Primavera has a huge range of natural skin, hair and bodycare products – including Organic *Eau de Toilette*.
www.primavera.co.uk

TO ORDER: To receive your discount, tel: 01373 467103 quoting '*Ecologist* offer' or order online (type *ecologist* at point of payment). Offer ends 31 March 2007

BODYCARE ESSENTIALS

ASPIRE TO LESS – 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 below carry products that have not been tested on animals; they contain no parabens, no petrochemicals and no synthetic ingredients.

Akamuti
www.akamuti.co.uk
Barefoot Botanicals
www.barefoot-botanicals.com
Earthbound Organics
www.earthbound.co.uk
Ecotopia
www.ecotopia.co.uk
Essential Care
www.essential-care.co.uk
Jo Wood Organics
www.jowoodorganics.com
Life Giving Organics
www.LifeGivingOrganics.com
My Being Well
www.mybeingwell.com
The Organic Pharmacy
www.theorganicpharmacy.com
Pure Nuff Stuff
www.purenuffstuff.co.uk
Pure Skin Care
www.pureskincare.co.uk

ECOTIP

CLEANSERS

Don't use special cleansers for your face – these are not much more than a mixture of diluted dish detergent and oil. Use castile or pure vegetable oils soaps, which will clean your face and neck without stripping them of the skin's own beneficial and protective oils. To remove make-up and city grime, use almond or jojoba oil on a cotton ball; rinse with warm water. Follow with a cool rinse or mild astringent such as witch hazel. From *What's In This Stuff?*, by Pat Thomas (Rodale, £12.99)

HEALTH & HOMEOPATHY

Ainsworths
www.ainsworths.com
Helios Homeopathic Pharmacy
www.helios.co.uk
Optima
www.optimahealthcare.co.uk
Pure Potions
www.purepotions.co.uk
Revital
www.revital.com
The Organic Health Shop
www.baughdell.co.uk

PERFUME

Aromasciences
www.aromasciences.com
Ascent
www.hayspace.co.uk
Dolma
www.veganvillage.co.uk/dolma
Primavera
www.primavera.co.uk

DON'T KNOW YOUR GLYCERYL LAURATE FROM YOUR DECYL GLUCOSE?

Find out what the words in your bodycare products really mean….

THE 'BEHIND THE LABEL' SERIES IS NOW ONLINE!
Go to www.theecologist.org/behind_the_label.asp

Past features by ***Ecologist*** Health Editor Pat Thomas include:
Clearasil deep cleansing 3 in 1 wash
Nivea moisturiser
Clairol Nice 'n Easy Hair Dye
Radox Herbal Bath with Juniper
Oil of Olay

ECOLOGIST ACTION MAKE YOUR OWN

Everyone's skin is different, so why not make your own bodycare products and cosmetics at home to suit your needs? The websites listed below will help guide you through ingredients that work for your skin and hair type, and offer a range of ideas for customising your favourite natural scents.

Aromantic
www.aromantic.co.uk
Bay House Aromatics
www.bay-house.co.uk
Cosmetics at Home
www.cosmeticsathome.co.uk
New Directions
www.newdirectionsuk.com
The Soap Tub
www.meltsandpoursupplies.com

THE MISSION

The amount of baby gear we purchase in the name of 'good' parenting – nappies, wipes, bottles, car seats, pushchairs, clothes, shoes, toys and other nursery items – is staggering. Given the ongoing expense of raising a child and the heavy competition that exists between different manufacturers for parents' custom, it's little wonder that many of the most common baby and child accessories have been made in sweatshops using chemicals that harm both our children's health and the environment.

THIS IS NOT ACCEPTABLE

We challenge the BABY & CHILD industry to make products with:
- **No potential carcinogens, neurotoxins and reproductive toxins**
- **No artificial additives, colourings or perfumes**
- **No petrochemicals**
- **No synthetic fibres**
- **Minimal packaging**
- **Organic ingredients**
- **Stop marketing to children under 16 years old.**

What we can do as consumers
- **Read and understand the label**
- **Buy fewer products**
- **Buy reusable products, eg cloth nappies**
- **Make our own, eg food**
- **Challenge stockists to sell safer products**
- **Support the small, independent and ethical producers and retailers in these listings.**

ecologist READER OFFER

ARAVORE BLANKETS

15% OFF ARAVORE BLANKETS

BABY RECEIVING BLANKET (80x60cm), RRP £35.00 (OFFER PRICE £29.75)
BABY COT BLANKET (100x80cm), RRP £45.00 (OFFER PRICE £38.25)

AraVore Babies specialises in beautifully handcrafted organic cotton garments for babies from 0-18 months. Set up by two sisters – one working in Paraguay, the other in London – the company was launched in the UK in October 2005.

All the cotton used by AraVore is grown by farmers in Paraguay and spun locally. The garments are made by women at the AraVore workshop in Asuncion using traditional methods. In a new project to increase the amount of organic cotton grown in Paraguay, AraVore is now sponsoring a group of small farmers switching from conventional to organic agriculture. This includes setting up a local farming co-operative and a community fund for improvements in health and education.

www.aravore.com.py

TO ORDER: To receive your discount, phone 020 8347 5752, quoting '*Ecologist* offer'. Offer ends 31 March 2007.

1 Lay open baby-shaped cotton nappy

2 Place flushable liner on top for easy removal of poo

3 Close using adjustable poppers

4 Add the waterproof wrap

THE ecologist PRESENTS ITS CLOTH NAPPY TRIAL PACK

Why use disposables when cloth nappies are easy to use, easy to clean and best for your baby? These ones are: SOFT Even after washing; SECURE Cinched legs prevent leaking; BREATHABLE Keeps bottoms cool and dry; ECONOMICAL Saves money over your child's time in nappies.

£26 25% OFF THE RRP (INC VAT)

Your trial pack includes:
- **3 leading brands of cloth nappies: Motherease, Tots Bots and Popolino**
- **1 pack of flushable and bio-degradable liners**
- **1 waterproof outer wrap**

SIMPLY CALL 01582 520037
Mon to Fri 9.30am to 5.30pm
quoting: **Cloth Nappy Trial Pack**

BABY ESSENTIALS

Includes bedding, breastfeeding equipment, maternity clothing, nappies (both cloth and eco disposable), nursery furniture, slings, skin and bodycare, toys and games.

Born
www.borndirect.com
Ecotopia
www.ecotopia.co.uk
Green Baby
www.greenbaby.co.uk
Greenfibres
www.greenfibres.co.uk
Hejhog
www.hejhog.co.uk
Little Green Earthlets
www.earthlets.co.uk
Natural Connection
www.naturalconnection.co.uk
Natural Nursery
www.naturalnursery.co.uk
See Saw
www.seesawnappies.co.uk
Smile Child
www.smilechild.co.uk

CLOTHING

Aravore
www.aravore-babies.co.uk
Baby Organics
www.babyorganics.co.uk
Belle & Dean
www.belleanddean.co.uk
Bishopston Trading Company
www.bishopstontrading.co.uk
Gossypium
www.gossypium.co.uk
Huggababy
www.huggababy.co.uk
Natural Child
www.naturalchild.com
Schmidt Natural Clothing
www.naturalclothing.co.uk

CLOTH NAPPIES

Sam I am
www.nappies.net
Snazzypants
www.snazzypants.co.uk
The Nappy Lady
www.thenappylady.co.uk

TOYS & GAMES

Arujo
www.arujo.co.uk
Escor Toys
www.escortoys.com
Gaia Distribution
www.gaiadistribution.com
Holz Toys
www.holz-toys.co.uk
Lanka Kade
www.lankakade.co.uk
Myriad
www.myriadonline.co.uk
Toyworm
www.toyworm.co.uk

SKIN & BODYCARE

Burt's Bees
www.myburtsbees.co.uk
Earth Friendly Baby
www.earth-friendly-baby.co.uk
Earth Mama Angel Baby
www.earthmamaangelbaby.com
Earthbound
www.earthbound.co.uk
Weleda
www.weleda.co.uk

WEDDINGS

DRESSES

Wholly Jo's
www.wholly-jo.co.uk

HONEYMOONS

Responsible Travel
www.responsibletravel.com

LISTS

Green Fibres
www.greenfibres.co.uk

RINGS

Cred Jewellery
www.cred.tv

Eco-Friendly Shop
Organic, Fairtrade, Recycled Gifts & Products
www.ecofriendlyshop.co.uk
01458 860830

Ethical Wedding Rings
www.silverchilli.com

VENUES AND CATERING

Fallow Fields
www.fallowfields.com

Penrhos Court
www.penrhos.co.uk

Montezumas
www.montezumas.co.uk

OFFICE RESOURCES

CARTRIDGES

Action Aid recycling
www.actionaidrecycling.org.uk

COFFEE AND TEA AND MILK

Fair-trade
www.fairtrade.org.uk

PAPER

Evolve
www.evolve-papers.com

STATIONARY

Ecotopia
www.ecotopia.co.uk

Remarkable
www.remarkable.co.uk

TELEPHONE & INTERNET

Green Isp
www.greenisp.net

The Phone Co-op
www.thephone.coop

WATER

Aquatic
www.aquaiduk.co.uk

CAREERS

Charity Action Recruitment
www.c-a-r.org.uk

Charity Connections
www.charityconnections.co.uk

Charity job
www.charityjob.co.uk

Countryside Jobs Service
www.countryside-jobs.com

Eden Recruitment
www.edenrecruitment.co.uk

Ends Environmental Job Search
www.ends.co.uk/jobs/about.htm

Environment Job
www.environmentjob.co.uk

Evergreen Resources
www.evergreen.org.uk

Execucare
www.execucare.com

Getalife
www.prospects.ac.uk

One World
www.oneworld.net

The Ethical Careers Service
www.peopleandplanet.org/ethicalcareers

FUNERALS

COFFINS

Nigel's Eco Store
www.theinsightecostore.com

The Sawd Partnership
www.bamboocoffins.co.uk

Somerset Willow
www.somersetwillow.co.uk

FLOWERS

Green Fuse
www.greenfuse.co.uk

Red Hen
www.redhens.co.uk

FUNERAL SERVICES

Family Care Funeral Services
www.ecofunerals.co.uk

Natural Endings
www.naturalendings.co.uk

Natural Death Centre
www.naturaldeath.org.uk

Green Undertakings
www.greenundertakings.co.uk

Green Ending
www.greenendings.co.uk

Olney Green Burial Company
www.thegreenburialcompany.plc.uk

Peace Funerals
www.peacefunerals.co.uk

Woodland Burials
www.woodlandburials.co.uk

ORGAN DONATIONS

UK Transplants

HOLIDAYS

COURSES

VOLUNTEERING

Action Without Borders
www.idealist.org
BCTV
www.bctv.org
Do-It
www.do-it.org
Environment Job
www.environmentjob.co.uk
Countryside Jobs
www.countryside-jobs.com
Timebank
www.timebank.co.uk

TRANSPORT

BICYCLE CAMPAIGNS
London Cycling Campaign
www.lcc.org.uk
Sustrans
www.sustrans.org.uk
National Cyclists Organisation
www.ctc.org.uk
BIO-DIESEL FUEL
Ebony Solutions
www.ebony-solutions.co.uk
BREAKDOWN
Environmental Transport Association
www.eta.co.uk

PERSONALS

CASSANDRA

Our end-time prophet attends a Tory-run seminar, where the climate of opinion still hotly favours trade and power

PHOTOGRAPH BY MARTIN USBORNE

'Trade In a Changing Climate' was the title of a seminar I attended in London last month, run by the Conservative Party. If you want to know why we are in such a mess and why there is not the remotest prospect of any government doing anything constructive to alleviate it or its consequences, you should have been there.

All the platform people seemed to share a common delusion that trade was a good thing regardless, and climate change was an unfortunate marginal matter of which we ought to take proper notice where we can, but meanwhile let us get on with the serious job of developing the economies of the poor countries so that they can enjoy the same standards of living (they really mean the same standards of material consumption) as we in the rich countries.

One speaker, a Julian Morris of an International Policy Network, as well as being a Visiting Professor of some luckless university, produced a stream of statistics to show that, over the past century or so, millions more people had been enjoying better health, better education, better life expectancy, lower infant mortality and so on – all of which, he appeared to urge, was the result of development and of free markets and that we could look for the same results from the poor countries if they would only brave the same route.

I listened in a sort of daze of disbelief that anyone professing to profess anything at all in matters academic could be so divorced from the realities around him and so blind as to where we were heading.

The rich countries have reached their current unsteady and utterly unsustainable apex of 'development' by bankrupting our posterity of basic resources such as oil; by perpetrating crimes against the natural world in terms of species poisoning and elimination, of soil and oceanic degradation that will beggar humanity for generations; by promoting the biological hoodlumism of global warming; and by disintegrating our local community structures, the oldest social unit in all human history, to such a degree that our prisons and hospitals are full to overflowing and that figures for such ills as cancer, venereal infections, juvenile behaviour disorders and psychotic forms of social dislocation and family breakdown are climbing to ever higher levels as millions resort increasingly to drugs and opiates to relieve the stresses all this wonderful development is imposing on them.

There is, of course, not the remotest prospect that the billions of people living in 'undeveloped' countries will ever experience anything remotely akin to the affluent consumerist lifestyle of the West. The resources are just not there and global warming is but one of a scream of planetary protests at the ways we have already abused our biological eminence to indulge our boardroom-dominated abandonment of social and ethical responsibility.

> 'I listened in disbelief that anyone professing to profess anything could be so divorced from the realities around him'

The signs are multiplying around us that global warming excesses – in terms of resource squandering, biological abuse, social disruption and psychic disbalance – have reached the limits that a finite planet can afford. Any attempt to pursue our current policies of 'development' can only hasten the onward ride of the horsemen of the apocalypse: of war, resource bankruptcy, an oceanic population flood, climatic catastrophe and economic breakdown as the global boardroom bubble goes pop, and the social immiseration of millions trapped in economic and political structures they have no way at all of controlling.

At heart, the problem confronting us, one which has bedevilled human scholarship and seeking for centuries, is not one of resources or of economic planning, it is one of morality.

What is the purpose of economic activity? The accumulated moral wisdom of humankind makes it clear that empires, especially modern boardroom ones, are too huge and too immersed in power struggles to even begin to entertain such questions. They are questions that pertain rather to the sphere where human relationships take their natural pre-eminence within the jealously guarded confines of small, localised human communities, ones where restraint and discipline can prevail on a consensual basis involving no loss of liberty.

The seminar was held in the Royal Society of Arts, which professes, I am glad to report, 'a tradition of challenging thinking'. I have to say I saw not a glimmer of this challenge here, not a hint of recognition that the coming decades are likely to see food riots in major cities of the West even more common than they are in Africa today, and that if we are serious about meeting the challenge of global warming with any concern for reality, we should be embarking on a massive global programme of de-industrialisation. One chairman of a discussion appealed for practical proposals; I could give him nothing more practical and imperative that that we should do just about the opposite of almost everything we are doing now.

In his 85 years, Cassandra has been an orphan, runaway, communist, cook, beggar, editor, presidential advisor, prisoner and priest. In a former life she was a Greek prophetess whose unerring prophecies of impending disaster were cursed to go unheeded.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