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CHOCOHOLISM
the Good, the Bad,
and the Ugly side
of our chocolate
addiction



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ARE YOU TOO FAT, TOO THIN, TOO SAD, OR TOO
HAPPY...? THE CONSEQUENCES OF BEING A
PILL AWAY FROM PERFECTION



COMPETITION
Win 25 of the
best alternative /
activist films

AVIAN FLU
Random act of nature
or man-made disaster
waiting to happen?

TIME TO CRY WOLF
...if we are to save the
forests of Scotland



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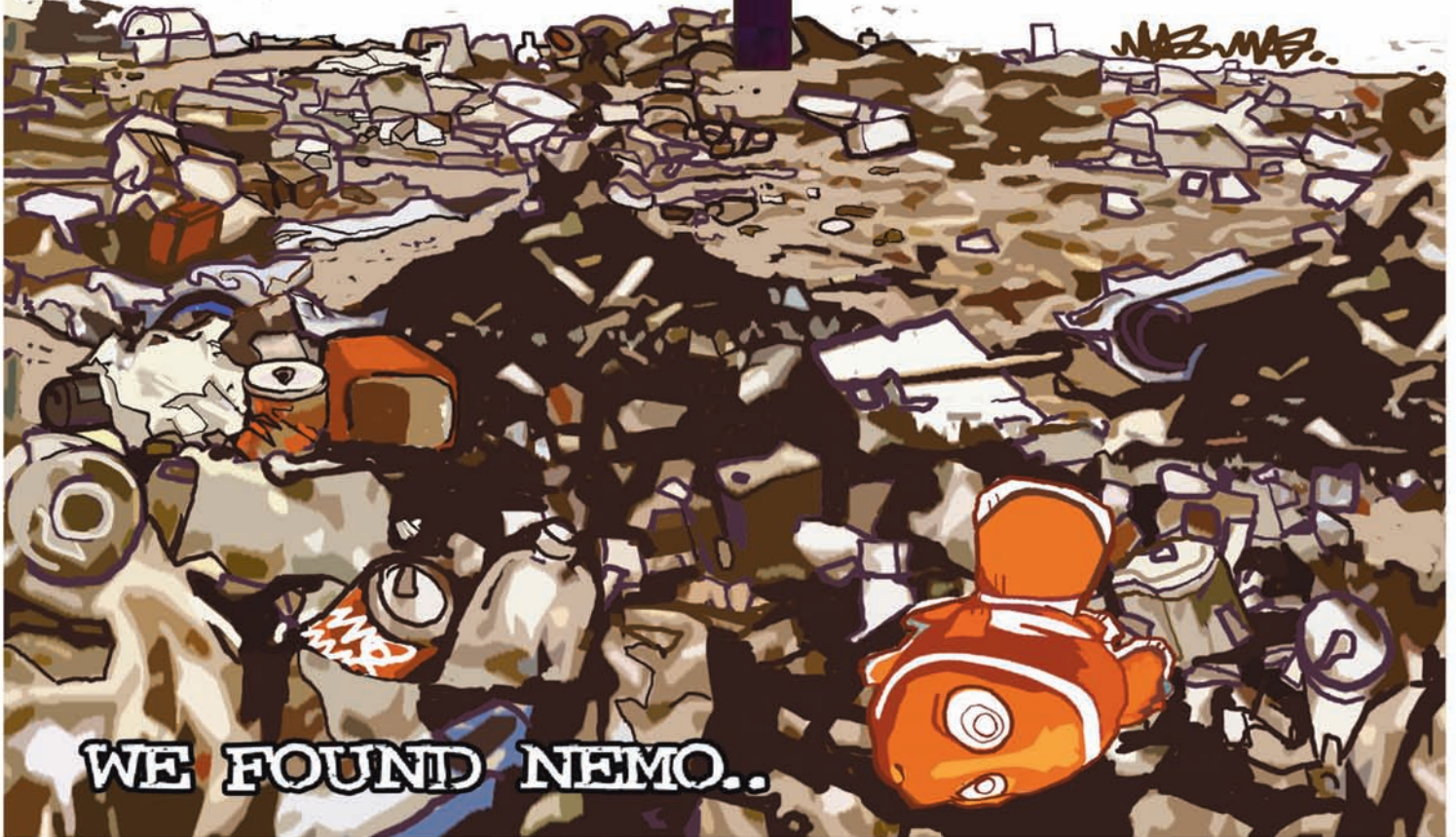


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Neighbourless
hoods, pg 40

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**Westminster
and Big Ben
shrouded in
thick smog at
midday.**

THIS MONTH IN HISTORY: DECEMBER 1952

On 5 December 1952 the weather was far colder than usual, and the inhabitants of London were burning far more coal than they usually did to stay warm. Because the winds were light and the air near the ground was moist, the conditions were perfect for *smog*.

The smog was caused by a meteorological phenomenon known as temperature inversion, which occurs when a layer of cool air close to the ground is trapped by warmer air above it.

Normally, the nearer the ground you are, the warmer the air is – which causes it to rise. However, and especially on cold winter nights, the ground often cools so much that it begins to lower the temperature of the air nearest it, causing the mists we often see across fields at that time of year.

On a clear morning the sun burns away the mist, but on 5 December

1952 there was so much coal smoke in the air that the sun could not get through.

The resulting ‘pea souper’ smog shrouded London for five days, as more and more coal smoke kept being added, until finally westerly winds blew it out to the North Sea. Thousands died in the worst air pollution disaster on record.

But that was back in 1952. Now that we don’t burn much coal, it couldn’t happen today could it?

While domestic coal burning is practically non-existent these days, there are now far more cars on London’s gridlocked roads (though considerably less thanks to the congestion charge). Indeed, from 12-15 December 1991 a mass of stale winter air settled once more over London. Beneath it were trapped a cocktail of toxic fumes, resulting in a smog that was considered responsible for 160 deaths.

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PHOTOGRAPH BY ALAMY

EDITORIAL



As London's Mayor, Ken Livingston has taken some bold steps, not least the introduction of his 'Congestion Charge' to counter the capital's growing traffic problems. The initiative has worked, and combined with a drive to increase Londoner's use of buses — up by more than 40% in five years — it has earned the Mayor justified praise.

But another Livingston campaign is less easy to understand: his decision to scrap London's much-loved Routemaster Double-Decker buses. Already more than half of the 2,800 or so Routemasters have been sold off, with the remaining buses being gradually replaced by a combination of modern double-deckers and so-called Bendi buses.

The given explanation is that Transport for London's (TFL) focus on the environment, its determination to modernise London's public transport infrastructure and its keenness to boost the number of bus journeys are incompatible with maintaining an ancient — albeit popular — fleet. That, combined with apparent calls from disabled people demanding greater wheelchair access, has formed the basis of Livingston's campaign.

But in fact the Routemaster hasn't been scrapped to make way for a cleaner, more efficient fleet. On the contrary — the 50-year-old vehicle is more environmentally-friendly than the vehicles which are replacing it.

According to TFL, the Routemaster does 8 miles to the gallon, as opposed to the 5.5mpg of a modern double-decker. It's been calculated that if all modern double-deckers were replaced with Routemasters, TFL would save at least 10 million gallons of fuel every year.

One of the reasons for this is that the design of the Routemaster is simple. Its body is lighter, it carries more people and has none of the modern bus's complicated systems and functions that consume engine power. For instance, whereas the ill-ventilated modern bus has to have an air-cooling system, the Routemaster relies on a simpler and greener

alternative — windows that open.

It's ironic, then, that Transport for London has cited 'reducing the energy consumption of transport' as one of its 'Tier One objectives'.

Another so-called 'Tier One objective', is to 'reduce noise and vibration by promoting the use of quieter vehicles'. But here again, the Routemaster outperforms its replacement. Not only is the Routemaster more fuel-efficient than any modern bus, it is also quieter according to tests carried out in 2005 by the UK Noise Association and Transport 2000.

Meanwhile, The London Cycling Campaign describes the 'Bendies' as 'cycle lane eaters', because of the awkwardness of their shape and size. But it's not simply that Bendies reduce cycle lanes. According to LCC, they are actively dangerous to cyclists because of their trailing end and because the bus driver can see less easily when turning.

Finally, we're told, the new model makes life easier for the disabled. But here too, things aren't what they seem. For wheelchair users, the old model is certainly awkward. But the Routemaster could easily be adapted. And because Routemasters have conductors — for the vast majority of disabled people — the 'walking disabled', blind people, very old people, sick people and so on, the new conductor-less model represents a dramatic downgrade.

For many, the loss of the Routemaster is a source of sadness. But its replacement has been begrudgingly accepted on the basis that it meets genuine environmental and social standards.

That basis is clearly wrong. The Routemaster's destruction has been sold to us on the largely bogus arguments of an establishment obsessed with modernisation for the sake of it.

■ Save the Routemaster. Call Policy Exchange on 020 7340 2650

Letters



RUNNING OUT OF TIME

Your coverage of the impending global peak in oil production was spot on. The article on the threats to our food supply was just the wake up call everyone needs. There should be no misunderstanding of the complexity and interconnectedness of this problem. If our species is to survive this challenge we will need a revolution in sustainability.

David Huck
Palo Alto, California

SWEET AND DEADLY

Your outstanding article, Aspartame, the shocking story of the world's bestselling sweetener (Ecologist October 2005), is the best and most comprehensive article that I have read on the additive. Embryos, fetuses, infants and children are the most vulnerable to chemical toxins in our environment. In view of current peer-reviewed research, nursing and pregnant mothers who use aspartame-laden diet drinks and products as low calorie food choices on a daily basis may be unknowingly placing their future children at risk. With rising rates of childhood leukemia, brain cancer and

non-Hodgkin's lymphoma, all mothers should be aware of the results published in the recent European Journal of Oncology since it demonstrates that aspartame is a carcinogenic agent. There is a window of extraordinary vulnerability in the developing child when exposure to chemicals can potentially cause consequences that may last a lifetime. Who is going to protect the most vulnerable among us, the FDA?

The New Mexico Environmental Improvement Board has wisely decided to hold hearings on aspartame. The existence of the EIB's authority was supported by legal experts, physician's and many interested citizens.

Karen Ulehla
Tucson, Arizona

NOT SO LOCAL, NOT SO SUPER

In the October issue, Simon Warrilow asked about people's purchases of fruit from supermarkets with their money making attitudes to hard and ripe fruits. He finishes his letter by asking "When are we just going to say no?". I would suggest that when Mr Warrilow can no longer start his letters with "I was in my local supermarket last week" then maybe he will have part of the answer.

Stephen Watson
By email

WRONG 'YARD' STICK?

I have noticed in your magazine that Neal's yard is promoted as an alternative supplier in your "Behind the Label" pages. I am slightly concerned by this as, although their products are significantly healthier than the mainstream products reviewed, I found that many of the moisturisers contained phenoxyethanol (a combination paraben said to be harmful if absorbed through the skin, or swallowed).

I stopped buying Neal's Yard products in July last year for this reason and am still awaiting a reply from them to my query regarding the use of this preservative.

Joanna McLeish
By email

IN A SPIN

The interesting article by Pat Thomas on Tyre Dust (Ecologist, November 2005) could have included some estimate of the proportion of tyre dust in average urban particulate pollution. A serious omission was the lack of reference to an EU directive that came into force in January 2005, prohibiting PM10 concentrations of more than 50 micrograms per metre for more than 35 days per year. This limit was breached in many continental cities in the first months of the year, prompting widespread publicity and legal action against a number of city authorities, yet there seems to be no discussion of this problem in the UK, although our cities are surely just as polluted. Given the health hazards emphasised by Pat Thomas, the complete neglect

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TAKE ACTION AT
www.theecologist.org/actions.asp



ecologist online debate

Every month we host a debate on the Ecologist website. If you want to take part, please register on our website, www.theecologist.org, and get stuck in.

THIS MONTHS: IS AVIAN FLU A GENUINE THREAT TO HUMAN HEALTH, OR IS IT JUST MORE GRIST TO THE TERROR MILL? Highlights from the debate so far...

This is nothing but a scaremongering tactic by the government and the real pandemic is in the actual real-time death and destructions going on in places like the MiddleEast, Africa, South America, etc

Behzad Rozei

As of 10 October, 2005, there had been 117 confirmed cases of avian flu in humans in

Indonesia, Vietnam, Thailand and Cambodia, leading to 60 deaths. The world population of humans at 6,556,773,622 putting the risk as very low. You have a far greater chance of killing yourself in a DIY accident, yet you do not see media hysteria telling us not to go up ladders!

Dave Wilson

It is no more worrying than other deadly diseases that COULD mutate with other diseases and become even more deadly. We did not worry yesterday - why worry today? What DOES worry me is the idea that the media

may have cried wolf one too many times, and that one day they will actually warn us of something worth being warned about...but the public won't listen. It will go down as scaremongering because this is what the media perpetually do.

Redmont

At the end of the day, and not wishing to be pessimistic, it is really only a matter of time before some disease does sweep the earth in order for nature to return to its steady state of dynamic equilibrium. The human race is similar in itself to birdflu, it has covered

the planet and is slowly killing it. I truly believe that very soon the planet's immune system will kick in in order to maintain order. It may not be birdflu that attacks us humans, but sooner or later some disease or virus will reduce the human population to sustainable levels

Jeremy Weiss

Please turn to page 14 for Pat Thomas' in depth report on Bird flu.

of this issue by environmental authorities here seems scandalous.

**Felix FitzRoy
St Andrews**

WARM WORDS

I was delighted to see that the most recent issue of the New Statesman was devoted to climate change, under the headline 'Why is it we still don't care?' Turn inside a few pages, however, and there was a full page advertisement for British Airways first class travel. Turn a few pages more and I saw that the magazine's competition was sponsored by Tesco. And to round things off, the back cover was an ad for BP. 'Why is it we still don't care?' asked the New Statesman. Might money have something to do with it?

**Lucy Weston
By email**

INTO THE LIGHT

Following one reader's request for references to his November article on GM 'Kept in the dark', **Jeffery M Smith replies:** The FlavrSavr study in the early 1990's was submitted to the FDA, but not published. This is the sorry state of regulations these days. It became public from a lawsuit and was described in Pusztai, A. et al. (2003) Genetically Modified Foods: Potential Human Health Effects. In: Food Safety: Contaminants and Toxins (ed. JPF D'Mello) pp.347-372. CAB International, Wallingford Oxon, UK. The lawsuit is described at www.biointegrity.org <<http://www.biointegrity.org/>> and memos from FDA scientists describing their reaction to the study is also at that site. The lesions were found in what Pusztai refers to as Study 677-004.

The person in charge of policy at the FDA was Michael Taylor. I spend time on this in Seeds of Deception in chapter 5. Citation: Smith, Jeffrey Seeds of Deception, Yes! Books, 2003. Taylor is also interviewed by reporters working for Fox TV, on the rbGH story: <http://www.foxbghsuit.com/> The cows in Germany were the subject of several articles, but sadly, no scientific studies. That's part of the problem. <http://www.i-sis.org.uk/CAGMMAD.php> includes an article, Cows Ate GM Maize and Died.

THIS WORLD Baffles ME

I was fortunate enough to notice your bold Aspartame cover (Ecologist, October 2005) in a Montreal bookshop and purchased it immediately since I am a fiend for any articles on sugar substitutes.

What baffles me is people scurrying towards chemically-based substitutes and foods that have been altered so much (fat in, fat out, sugar in, sugar out – ad nauseum). Never in all of this does the average joe appear to consider that one of the reasons why so many diseases continue to ravage the world is because of these constant toyings with foods we ingest.

**Leslie Golden,
Montreal, Canada**

ERRATUM

In the October edition of the Ecologist, the article 'The Flu Vaccine - A Shot in the Dark?' included incorrect statistics for the death rates from the 1918 flu. The correct death rates should read 30 per 1000 in Sub Saharan Africa and India and 5 per 1000 in North America.



PHOTOGRAPH COURTESY OF GREENPEACE UK

AMAZON DESTRUCTION WORSE THAN PREDICTED

New research from Brazil and the US suggests that the deforestation of the Brazilian Amazon has been underestimated by at least 60 per cent. A team of scientists used satellite imagery to get a more detailed picture of what was happening in the rainforest below. Whereas traditional aerial photography is good for showing when vast swathes have been cut away, it often misses more selective logging practices, such as when highly profitable species like mahogany are

removed, but the forest around them remains intact.

Using ultra-high-resolution techniques, the scientists, whose report was initially published in the journal *Science*, concluded that the area of rainforest destroyed between 1999 and 2002 was thousands of square kilometres bigger than previously thought. Furthermore, they learnt that 25 per cent more carbon had been released into the atmosphere than previously thought.



EU BOWS TO CORPORATE PRESSURE

In another move that shows just how removed from the wishes of European citizens the EU is, the European Union voted to ignore its own Environment Committee's recommendations to tightly regulate a class of global warming chemicals. The European Parliament rejected a proposal to replace HFCs (hydrofluorocarbons, which are 1,300 times stronger than carbon dioxide), in household refrigerators, even though the EU market is already dominated by much more benign alternatives.

Why might this have happened? Lobbying from multinationals, of course. As Mahi Sideridou, a Greenpeace climate and energy policy advisor based in Brussels explained in a recent interview: 'I'm totally outnumbered here. There are dozens of industry lobbyists yammering on about how these climate-killing chemicals are "a part of the social fabric of Europe" and suggesting that banning them will mean disaster for European industry. When I tell parliamentarians that the home refrigeration market has already demonstrated that alternatives are available and commercially proven, it's often the first they've heard that alternatives even exist.'

HERO OR ZERO?



HERO: BARACK OBAMA

He's young, he's black, and he's tipped to be Hillary Clinton's running mate at the next US presidential elections. Chances are power will go to his head (it always does), but for now he's making all the right noises. In November, Senator Obama placed a hold on President Bush's latest cronie nomination. Bush had nominated Susan Bodine to head the EPA's Office of Solid Waste and Emergency Response. Obama was livid because, since 1996, the agency has been under order to implement rules for lead-paint exposure from home renovations. The EPA's own figures show that about 1.4 million children under the age of seven are at risk of exposure to health-impairing levels of lead from home repairs and renovations. Obama, whose state of Illinois also has the highest rate of childhood lead poisoning, said that he would block all further EPA nominations too. As a result the EPA said it would implement the rules by the end of the year, to which Barack replied that he wanted it in writing before he backed off.

30

tons of rock mined, moved, and saturated with diluted cyanide to produce one oz of gold.



PARLIAMENT SETS AN APPALLING ENVIRONMENTAL EXAMPLE

In almost all areas measured, the UK parliament's use of non-renewable resources and environmental impact has worsened dramatically in the last few years, says a new report. Since 1997, the year New Labour came to power, water consumption has risen by 58 per cent, electricity use by 45 per cent and gas consumption by 34 per cent. That Tony Blair can continue to declare that, under him, the UK is an environmental leader seems increasingly hypocritical when MPs can't even get their own house in order.

According to the report, *How Green is your Parliament?*, the ways in which MPs are fed and watered leaves a lot to be desired: 85 per cent more bottled water is now purchased than just four years ago, a third of all beers and ciders consumed are foreign brands, and a third of the fish purchased was from threatened fish stocks.

'It's all very well for us as MPs to call on the general public to act and take measures to protect the environment,' said Norman Baker, Liberal MP for Lewes, who commissioned the report, 'but how can we expect them to listen if we do not do this ourselves?'

91

THOUSAND

tons of ice cubes ordered by the US Federal Emergency Management Agency, intended to cool the victims of Hurricane Katrina along with their food and medicine.

A robotic fish, which navigates by sensors and mimics the motion of real fish, many of which are at risk of extinction due to overfishing.



WHAT WE LEARNT LAST MONTH...

- A student in North Carolina was visited by the FBI after sending his photos to Walmart to be developed. One of the photos showed him standing beside a poster of George Bush, giving him the 'thumbs down'.
- Male mice serenade prospective female partners with rich and diverse songs.
- Scientists developed a kettle that you could switch on by text message from your mobile phone. According to one over-zealous spokesman: 'It could revolutionise tea-time. Now there is no excuse for not putting the kettle on.'
- A French company's attempt to trademark the smell of fresh strawberries was refused by the EU.
- Eachnet, the Chinese version of Ebay, was offering baby boys for \$3,450, while girls were a snip at just \$1,603.
- President Bush's job approval rating among African Americans was just two per cent (with a margin of error of up to three per cent)
- Danish soldiers in Iraq and Kosovo were issued special relaxing pillows that make a noise like birdsong.
- A Japanese woman buried herself in a pit in India for three days in a bid to create a better world. Her attempt failed.
- Socks made from corn went on sale in Japan
- In the same month that Wal-mart released a study showing that Wal-Mart was good for the US economy, the firm lost a court appeal in which it tried to make it illegal for its employees in Germany to have romances with each other
- Russian scientists invented a device that can be attached to turtles so they can be steered by a human with a remote control. The idea is to use them underwater spying missions.



DAM FAILURES

The construction of large dams continues to cause excessive social and environmental damage, despite recommendations made by the World Commission on Dams, says the WWF.

In 2000, Nelson Mandela launched the report of the World Commission on Dams, which had been charged with developing internationally accepted standards, guidelines and criteria for decision-making in the planning, design, construction, monitoring operation and decommissioning of dams.

WWF's report *To dam or not to dam? Five years on from the World Commission on Dams*, examined six major dams, under construction in the last five years. It found that all of them fail to meet these recommendations.

In Belize, for example, the report found that the \$30 million Chalillo Dam was meant to reduce electricity imports and lower electricity prices. Yet since its recent completion, local people have seen 12 per cent average increase in electricity prices and the dam has also flooded 1,000 hectares of pristine rainforest. Meanwhile, the

livelihoods of 50,000 people in Laos will suffer when water is diverted from the Nam Theun River as a result of the Nam Theun 2 hydropower project, a project approved by the World Bank. Increased water flow into the Xe Bang Fai River will reduce fisheries and agricultural land.

Dams have already fragmented 60 per cent of major rivers worldwide and displaced up to 80 million people. Currently, over 400 large dams are under construction worldwide and hundreds more are planned.

■ Picture courtesy of WWF-Canon/Michel GUNTHER

Wow, Brazil is big!

George W Bush, on being shown a map of where he was visiting by the country's president, Luiz Inacio 'Lula' da Silva



EATING GREAT APES TO EXTINCTION

Orangutans are in serious danger of extinction as their rainforest habitat is being destroyed and replaced with palm oil plantations. A new campaign by Ape Alliance, a coalition of international NGOs including Friends of the Earth, Borneo Orangutan Survival Foundation and Nature Alert, has launched the worldwide campaign arguing that if you buy common household items such as crisps, ice cream, detergents, bread, lipstick and soap that contain palm oil, you are helping to drive orangutans to extinction.

■ www.4apes.org



Total's investment is propping up a sadistic, hideous regime, providing it with a cloak of respectability, behind which it can continue its brutal oppression of the Burmese people. Total's presence does nothing to advance the case for democracy in Burma. Moreover, its harmful influence on the French government is obstructing effective action by the EU and the UN against the military junta. We urge Total to follow the lead of respectable European companies, to value human rights above the pursuit of filthy lucre, and withdraw from Burma.

Vera Baird QC, MP and John Bercow MP, urging representatives of Total oil to withdraw from Burma during a meeting on the 10th anniversary of the detention of the country's democratically elected leader Aung San Suu Kyi



BIRDS OF A FEATHER

What are the real reasons behind the vast resources being ploughed into protecting against bird flu by the US and UK governments? As always, follow the money...

In the US, President Bush called for Congress to provide US\$7.1bn in emergency funding against the potential pandemic – of which \$1Bn was set aside to pay for stocks of the Tamiflu vaccine. Tamiflu has an interesting history.

In 1996 it was patented by biotech firm called Gilead Sciences Inc. One year later, Gilead got a new chairman. Donald Rumsfeld. Rumsfeld still holds a stake in the company, valued at somewhere between \$5-\$25m. Over the last few months Gilead's share price has soared from \$35 to \$47, primarily on the back of the rush to buy its vaccine. This rise will have netted Rumsfeld around \$1m.

Back in the UK, our PM is better known for his links to GM. In an interview with *The Times* at the end of October, Laurence Tiley, Professor of Molecular Virology at Cambridge University, said: 'Once we have regulatory approval, we believe it will only take between four and five years to breed enough chickens to replace the entire world [chicken] population.' Bird flu occurs when millions of industrially bred birds live in cramped, unhygienic conditions. The solution? Replace the entire diverse world stock with a monoculture of GM birds. Makes you feel much safer.

DON'T BELIEVE THE BIOTECH HYPE

Despite promoting its drugs as the cures of all our ills, biotech's actual results make somewhat different reading, as a recent report in the *British Medical Journal* makes clear. The authors assessed biotech medicines approved by the European Medicine Evaluation Agency from 1995 to 2003. They found that as regards Biotech drugs: 'Only a small proportion are therapeutically innovative', 'Most new products were variations on existing drugs' and 'The promises of good tolerability of biotechnology substances have not been met – most are no less toxic than conventional drugs.'





Activists protesting catalogue underwear retailer Victoria's Secret, which sends out about 395 million catalogues a year on paper from ancient trees. www.victoriasdirtysecret.net

64 MILLION

Pounds of chemical warfare agents secretly dumped by the US Army between 1944 and 1970. A two-part investigation by *Virginia's Daily Press* revealed that the Army has no idea where most of these dump sites are, whether the munitions are leaking, or what effect they may be having on the environment.

“

I'll have a better job, a better boyfriend, and eventually a better husband. It's a long-term investment.

Progress arrives in China, as an unnamed Chinese woman explains why she is enduring the months-long 'Ilizarov procedure' (forced breaking of bones in the leg, then manually adjusting leg braces four times a day that pull the bones slightly apart, then waiting as the bones grow and fuse together).

”

NA CHINA CHINA CHINA CHINA CHINA CHINA CHINA



WHERE HAS CHINA'S WATER GONE?

China is struggling to combat a water crisis that can only get worse as it continues its current rapid development and ever greater numbers of people consume the country's

finite resources. Even now, water availability in the country is only about a quarter of the world average. Several factors only serve to exacerbate this. Across the country, rivers are so heavily polluted that much of their water is undrinkable, less than half the waste water created is recycled, and around 20 per cent of the urban water supply is lost through poor plumbing. To make matters worse, months of drought made worse by global warming have

wiped out farmland, caused rivers to dry up and reservoirs to empty.

POST APOCALYPTIC URBAN LIVING CHINESE STYLE

The water's running out, the air's filled with smog, the farmers are leaving the land – what should China do to combat the environmental crisis that is getting worse by the day? Build more cities? Not just any cities mind you. The Chinese government has hired British architecture firm Arup to design up to five self-sufficient 'eco-cities'. The idea is that these new eco-cities will be self-sufficient in water, energy and much of their food supplies, with climate-neutral public transport systems. It might seem like a good idea at first, and of course the principle of developing sustainable urban centres makes sense. But one line in a *Guardian* article on the subject casts the whole idea in a rather different light. The paper writes: 'The eco-cities are regarded both as a prototype



BUSHMEN TAKE ONE STEP FORWARD, ONE BACK

In a surprising, yet welcome shift in fortunes for the country's Bushmen, at the end of October the Botswana High Court ruled that the government must allow Bushman

Amogolang Segootsane and his family to return to their land in the Central Kalahari Game Reserve. It must also return his goats and allow him to bring water into the reserve. The government closed the reserve in September and removed all the Bushmen's goats, claiming that they were diseased – a claim dismissed by an international panel of vets as 'spurious'.

Stephen Corry, director of Survival, an organisation campaigning for the Bushmen and other indigenous people's rights, said of the court victory: 'This is great news. We're very pleased that the rights of the Segootsane family have been upheld by the court, although it remains to be seen whether the government will abide by the court's ruling. Now the government surely must also allow all the other evicted Bushmen to return home.'

The prospects for such an event happening soon, however, are bleak. Only days after the court decision, a Bushman woman was reported to have died, thought to have starved to death after wildlife scouts blockaded the reserve and stopped the Bushmen gathering food. According to the Bushman organisation First People of the Kalahari (FPK): 'FPK suspects that she died of hunger and thirst as wildlife scouts would not let her gather food, or that the scouts killed her.'

NA CHINA CHINA CHIN

for urban living in over-populated and polluted environments and as a magnet for investment funds into the rapidly growing Chinese economy.' It seems that rather than China trying to avoid making its problems with pollution and overpopulation worse, it is designing cities to survive in such a grim world. Whatever model these cities are designed upon, they still serve as magnets for rural-urban migration, further increasing China's reliance on imports to feed itself. At the same time it is trying to attract yet more investment into an economy growing faster than any other in the world – the same rapidly growing economy that has caused the pollution and overpopulation that created the supposed need for these cities in the first place.



GLOBAL WARNINGS

Another month of more warnings – and more inaction – as the world gets ever hotter. When will we wake up?

WHAT'S HAPPENING...

- Xcel Energy, a renewable energy supplier in Colorado, announced that it would be selling wind-generated power at less than electricity from fossil fuel power stations. As many new customers signed up in one day as normally do in two months.
- When the *Ecologist* went to press, 2005 was set to be the second hottest year on record (1998 was the hottest).
- Coral reefs off East Africa were predicted to be wiped out in 20-30 years if temperatures continue to rise at their current rate.
- The International Energy Agency warned that greenhouse gases are set to rise by 52 per cent by 2030 unless serious steps are taken to reduce emissions.

WHAT'S BEING DONE...

- At a major international climate change conference that took place in London in early November, Tony Blair commented: 'the blunt truth ... is that no country will want to sacrifice its economy in order to meet this challenge.'
- Despite setting itself a target of increasing spending on renewable energy by 20 per cent each year for the next five years, the world banks spent only an extra seven per cent over the previous year, according to a new report by Friends of the Earth.
- And a seemingly unrelated article on the BBC website announced that 'Manufacturing output drops again'. Despite this article occurring on the same day as the IEA's apocalyptic warnings, and despite the industries most effected being named as chemical and man-made fibre production (both of which rely on oil), this was presented as an unqualified Bad Thing. 'The manufacturing sector's acute underlying weaknesses reinforce our view that the Government must act firmly and rapidly to remove the threat of further tax increases on business,' said David Kern, economic adviser to the British Chamber of Commerce. No one suggested that a reduction in manufacturing, especially of such oil-intensive industries, was exactly what we need to do to reduce emissions.



AVIAN FLU

THE ECOLOGY OF AN EPIDEMIC

Bird flu has been raging through Asia for more than a decade. But it is only recently that most of us have started to pay attention to the story. **Pat Thomas** separates fact from fiction and asks whether this is a random act of nature or yet another man-made disaster.

The words 'bird flu' strike terror into many hearts for many different reasons. As the story of Avian influenza H5N1 gains momentum, the panic induced by the possibility of a virulent strain of influenza that not only jumps national borders but might also jump species has galvanised several influential sectors of society into action.

Farmers, fearful for their economic survival, are slaughtering hundreds of millions of birds in order to control the virus. Doctors, seeing an opportunity to save humanity from a potential pandemic and get published at the same time, are busy studying this and other related viruses. Drug companies, spying an unprecedented opportunity for profit, are busy attempting to produce experimental vaccines and anti-viral medicines for both animals and humans. The media, hungry for a good scare story, have been able to generate a more or less daily flow of such tales. Politicians looking for political capital are talking about quarantines, closing borders and waging war on a microscopic enemy.





But think about it. After several years of intense analysis and debate, how much do you really know about H5N1? If you are like most people you have probably, at some point in the narrative, confused

the actual bird disease with the theoretical human one. Like many people you may have been distracted from the process of examining the origins of the outbreak among poultry by predictions of the

ALL YOU NEED IS DRUGS

Worry about a human pandemic, coupled with acceptance of the idea that drugs will save us all, has allowed pharmaceutical companies to set the agenda for how we respond to the threat of bird flu. It could be argued, however, that this quick-fix solution is of greater benefit to the pharmaceutical industry than it is to most average people. Last year Roche's profits were in the region of £144 million. This year, thanks to the antiviral Tamiflu, this figure is expected to soar to £500 million, and next year £1 billion.

In preparation for a potential pandemic caused by a human mutation of H5N1, governments throughout the world are stocking up on vaccines and anti-viral medicines. Off the back of a potential crisis, many governments have cynically promoted this year's flu vaccine as a way to stop H5N1 mutating – without a shred of evidence that this is so. Indeed, as a general rule vaccines force rather than prevent viral mutations. Equally cynical was the recent PR campaign by Roche, which at the height of people's fears over a potential human variant of H5N1, painted their antiviral Tamiflu as a near natural remedy derived from the Asian herb Star Anise, when in fact only a single constituent of the herb is used at the beginning of a 10-stage, year-long manufacturing process that results in a synthetic substance very different from the natural herb.

Step away from the hype and the truth is that Roche has developed a method for producing Tamiflu without using Star Anise, so stories about scarce supplies of Star Anise leading to Tamiflu shortages can only be viewed as an attempt to drive the price of the remedy up – and it's worked. Last year Tamiflu was retailing at around £16 for 10 pills. Today on the open market people are paying £100 or more for the same five-day supply.

While several pharmaceutical companies are now racing to develop a vaccine against H5N1, the likelihood is that the virus will have mutated significantly in the time between the development of the vaccine and any future outbreak, epidemic or pandemic, making a vaccine based on the virus's current genetic incarnation useless.

Consider also the unintended consequences of vaccination. In 1976 in the US an outbreak of swine flu among soldiers at Fort Dix, New Jersey, was found to be related to the 1918 influenza strain. One soldier died and 50 million Americans were vaccinated against an epidemic that never happened. In the end the vaccine, which triggered Guillain-Barré syndrome, a neurological disorder similar to polio, killed more people (32 in all) than the flu itself.

Vaccinating entire flocks of birds against the current strain of avian flu has also been put forward as a solution. But given the poor effectiveness of the human flu vaccine, it is hard to see this as a viable alternative. It may even make things worse.

In poultry, as in people, a vaccine may prevent some animals from falling ill, but it can also foster a 'silent epidemic' where the birds still carry low numbers of the virus which can still replicate and mutate inside their bodies, often at an unprecedented rate, and with unpredictable consequences. Scientists reporting on Mexico's experience of H5N1 in the *Journal of Virology* in 2004 say that these silent epidemics can easily force the evolution of new and more virulent strains of influenza that more easily jump from birds to people.

In the same way that antibiotics can force super resistant strains of bacteria, antivirals can also produce stronger, more virulent viruses. Studies show that the avian virus is now resistant to most antiviral medicines including the Tamiflu, which the UK government has recently purchased in great quantities. Even if resistance was not a problem, Tamiflu is of uncertain benefit. It must be taken within 24-48 hours of the appearance of symptoms and even then it is not a cure or a 'temporary vaccine' as some of the newspapers have called it. Summaries of scientific literature show that Tamiflu will only reduce the duration of the flu by an average 1.3 days. In some individuals it may reduce severity of symptoms but taking it over the long term, as many will be tempted to do, can reduce its overall effectiveness, has never been proven safe, and may have unintended and as yet unstudied interactions with other medications.

Another antiviral, GlaxoSmithKline's Relenza, has not shown any resistant strains – yet – and reduces the duration and severity of flu to the same degree as Tamiflu. But as it is inhaled rather than coming in capsule form it is not for everyone (for instance the very young), and it can also cause severe breathing difficulties in people with asthma and/or chronic obstructive pulmonary disease (COPD).

If a pandemic does occur, and if it proves deadly, it will not be because our drugs were not strong enough, but because our immune systems were not. In this way things may have not changed very much from 1918. Only now it's not world war, but the chemical warfare waged on our bodies by a constant barrage of toxic chemicals, poor quality food, and increasing levels of stress that makes us sitting ducks for the next pandemic.

While there is still time, while H5N1 remains a bird rather than a human epidemic, while tens of billions are being made available in preparation for a potential pandemic, a commitment to improving diets, lifestyles and living conditions of the population as a whole, and the most vulnerable in particular, and to improved education about hygiene and the nature of viruses, would be our best medicine. Terrifyingly, this has yet to be put on any government agenda.

imminent annihilation of the human race. Yet it is only by examining the ecology of avian influenza that we can begin to understand where we are now and where the disease might be going in the future.

Avian influenza is a generic term for any number of influenzas that can arise in and infect birds. There are 16 known types of avian influenza of which type-A H5N1 is just one.

While it is widely assumed that the first outbreak of H5N1, more commonly known as 'bird flu', occurred in South Korea in December 2003, this unusually virulent virus has been with us for a long time. Retrospective data from the World Health Organisation shows that in the last 45 years or so, H5N1 has accounted for four of the 21 known outbreaks of avian influenza in commercial poultry throughout the world. The first occurred in 1959 in Scottish chickens. It emerged again in 1991 in English turkeys, and then in 1997 and again in 2002 among chickens in Hong Kong.

In the last 10 years or so the virus has made gains in virulence and transmissibility among birds and once conventionally reared poultry become infected, outbreaks can be difficult to control and often cause major economic damage to poultry farmers in affected countries.

Kentucky Fried Flu

There is good reason to believe, however, that it is not the virus, but the inhumane conditions in which the birds are reared that is most deadly. Rearing animals in crowded conditions, feeding them unnatural diets, and exposing them to unimaginable stress during their short lifetimes creates a breeding ground for illness, infection and eventually epidemics.

Such appalling conditions arise from our general apathy and inaction as regards the importance of animal welfare, but also from our evolving belief that cheap food in general and cheap



There is good reason to believe, however, that it is not the virus, but the inhumane conditions in which the birds are reared that is most deadly

chicken in particular is some kind of human birthright.

The average chicken you buy in the supermarket may be 'British' (a loose definition that can include a chicken that was grown and packaged in this country or one that was shipped in from somewhere else and packaged here), but the vast majority of chicken 'products' – nuggets, goujons, kiev, pizzas, pies,

sandwiches, ready meals and airline, school, hospital and pub meals – are generally made from chicken imported from abroad. Likewise, the proliferation of fast food restaurants on British high streets rely on a steady supply of cheap imported chicken to sustain them.

Consumers, of course, rarely know where their chicken has come from. Before the outbreak, few knew that the Asian region affected by the spread of avian flu is home to around seven billion chickens, approximately 40 per cent of all the world's poultry. After the US, Brazil, and the EU, Thailand is the fourth largest exporter of poultry in the world.

The amount of chicken imported

from Thailand into the UK has grown considerably over the last few years. In 2000, more than 23,420 tonnes of prepared chicken was imported into the UK from Thailand. By 2003 and 2004, when avian influenza was in full swing, this figure had risen to 45,073 and 44,316 tonnes respectively. So even at the height of the outbreak it's a fair bet that you have eaten Asian chicken in some form over the last year or two. To meet our increasing demand for cheap chicken Asian farmers (indeed poultry farmers everywhere), are encouraged to produce lots of birds quickly and cheaply. Inevitably corners – in hygiene and animal welfare – get cut.

While news reports have focused on heartbreaking stories of family farmers whose small flocks have been devastated by avian flu, this does not give a true picture of the Asian poultry business, which is home to many vast battery farms (indeed Tesco is the majority share owner in one of Thailand's largest battery farms). One of these farms is rumoured to house as many as five million birds. Under these conditions a farmer is nothing more than an impotent guardian, unable to spot disease when it first emerges and unable to stop its spread once it takes hold.

Killing with kindness

Since mortality rates are high with H5N1, infected birds are generally destroyed, or 'culled', in order to prevent the spread of the disease within the flock and to neighbouring farms. To date, the current outbreak in Asia and the more remote corners of the EU has resulted in the culling of more than 100 million birds.

Culling, however, is a crude and ineffective method of disease control. When H5N1 first appeared in Hong Kong in 1997 some 40 million birds were culled. This did not stop the disease emerging more strongly than ever in 2002. Nor did it prevent it crossing national borders or infecting human beings.

Culling *wild* birds in the hope of stopping the international spread of the virus is an equally violent and futile act. In July 2004, the UN's Food and Agriculture Organisation (FAO) cautioned that doing so was ineffective and 'will not help to prevent or control avian

influenza outbreaks'.

Wild birds are natural reservoirs for many types of virus and most of the time they are immune to illness. While local authorities panic at every dead duck found in a pond or lake, it is worth remembering that the spread of avian influenza through wild birds is limited by the simple fact that sick birds do not fly far, and dead birds don't fly at all. It is hardly surprising then that, to date, there is no scientific evidence that wildlife spreads the disease to domestic or commercially reared birds, or that it is the major factor in the resurgence of the disease in Asia or of isolated outbreaks in countries such as Turkey, Greece and Romania.

Other proposed solutions such as hunting wild birds, some of which are listed as endangered, or cutting down trees to destroy roosting sites, are more likely to disperse wild birds into new areas, stress them further and make them more susceptible to avian influenza and/or other diseases.

Furthermore, the FAO has emphasised that wildfowl are also an important element of the biologically complex wetlands ecosystem, acting as herbivores, predators and prey, as well as facilitating plant dispersal. Killing them on a just-in-case basis would have profound ecological impacts.

Culture of death

The 'culture of death' that surrounds sick animals is not new. One needs only to look back as far as 2001 and the outbreak of foot and mouth disease in Britain to find significant examples of the tendency to wage war on nature every time our manipulation of it threatens the global economy.

Like avian flu, foot and mouth is caused by a virus. The characteristic sores on the mouths, gums, teats and other parts of infected animals are little more than large cold sores. If they are well cared for, afflicted animals usually recover within a week or two, just like humans with the flu. Yet in 2001, rather than waiting for the animals to get better, millions of sheep and cows in the UK were culled in an effort to keep the disease under control. This slaughter occurred in spite of the fact that there was no threat

to humans from the meat of infected animals.

The fact is that animals, like humans, get sick. For example, figures from the US Department of Agriculture show that since 1997 more than 16 outbreaks of H5 and H7 influenza have occurred among poultry in the US. From the birds' perspective such outbreaks usually result in either no illness or mild illness and low levels of mortality. To date there has been no evidence that the virus is transmitted through the meat or eggs from infected birds.

When problems such as foot and mouth or avian flu arise, out-of-proportion publicity about the risks to human health are often used to obscure more pressing issues such as the way these hard to control, but otherwise natural and cyclical occurrences threaten to expose the economic reality of intensive farming.

From a modern farmer's perspective sick animals are unproductive animals. In farmed birds catching the flu is undesirable due to the way it temporarily slows down growth and reduces the number of eggs a bird will lay. The unspoken and unanswered question is: is it cheaper (or even more profitable given the carrot of government subsidies for culling) to kill them than to sit out a period of decreased productivity that naturally accompanies any period of illness?

Farmers argue that culling is kinder to the birds since up to 90 per cent of birds infected with avian flu will die anyway. If kindness and animal welfare were really on the top of farmers' agendas, however, we would be looking seriously at the contribution of modern intensive farming practices to the emergence of highly pathogenic H5N1.

Should bird flu spread widely beyond Asia, its impact on human health may be much less destructive than feared (see page 21), but it will certainly devastate a multi-billion pound poultry industry. While it's hard not to feel some sympathy for farmers, there is good reason to believe that when our animals get sick we are being hoist by our own petard.

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WHAT IS THE RISK?

How real is the threat of a human flu pandemic caused by H5N1? Nobody knows – and this provides scope for often wild speculation based on sketchy science. **PAT THOMAS** REPORTS.

The most pressing concern about bird flu is that it will mutate into a variety that will easily infect humans. To date this has not happened; the people in Asia who have become ill or died from H5N1 have been infected with the bird virus, rather than a mutated human virus.

Most avian influenza viruses remain unique to their hosts and pose no threat to human health. However, under the right circumstances, some can ‘jump’ from animals to humans. In this respect H5N1 is not unique.

Of the 16 known types of avian influenza, three subtypes – H5, H7 and H9 – are known to be capable of crossing the species barrier. Since 1997 types H5N1, H7N2, H7N3, H7N7, and H9N2 have

all caused small, confirmed outbreaks in humans throughout the world. The fact that a virus can cross the species barrier, however, does not mean that it is dangerous.

For instance, just because H5N1 is lethal in chickens doesn’t necessarily mean that it will be so in humans – the virus could just as easily mutate into a less virulent form as it can a more virulent one, and the direction of its mutation is difficult to predict. Likewise few humans live in the crowded conditions common to battery chickens and, for this reason, even if the virus were to jump species, it may not necessarily spread as quickly through the human population as it has with chickens.

While scientists suspect that H5N1

may have been spread between one mother and daughter in Thailand, this remains unconfirmed. To date there is no unequivocal evidence of person-to-person transmission. Instead, the handful of human cases can be traced back to direct contact with the faeces and blood of infected birds. Likewise there has been no evidence that the virus is transmitted through the meat or eggs of infected birds.

It is also worth remembering that since the 2002 outbreak of H5N1 there have been literally billions of interactions between chickens and humans. Yet, according to the FAO’s Technical Task Force on Avian Influenza, the number of humans who have been infected with avian influenza over the last two years

totals just 118, and these cases are largely confined to Vietnam, Thailand and Cambodia.

Nevertheless, viruses can mutate rapidly and many molecular virologists are concerned that it would take little more than a chance mutation to turn H5N1 into a deadly, easily transmissible human disaster. Such mutations, however, don't occur out of context.

If a host becomes infected with two or more viruses simultaneously, these can easily swap genetic material and mutate into new and never-before

seen strains. If one virus happens to be extremely communicable and the other extremely lethal, a mixing and matching of their genes could produce a lethal hybrid. If one virus is from an animal such as a bird or a pig, and the other is from a human, the result may be a virus

that can easily infect humans. However, in a virus that is largely contained among birds, such as H5N1, the chance of swapping genetic material with an easily communicable

human virus is low.

Likewise for the virus to spread

easily among humans it would have to produce specific symptoms, such as coughing and sneezing, and lodge itself in easily accessible major airways. The few autopsies performed on human victims of H5N1 have revealed that the virus lodges deep in the crevasses of the lung tissue, not in the major airways as would be the case in an infectious flu.

No one can predict when or if the virus will mutate into the 'potential doomsday virus' described in a recent edition of *The Sunday Times*, but clearly it is still more than a random mutation away.

No one can predict if the virus will mutate into something worse

HOW DEADLY IS DEADLY?

Forecasts of how deadly the virus will be should the pandemic occur are prone to vast disparities. Consider the predictions for the UK. While a figure of around 50,000 deaths in the UK is widely quoted, eminent scientists such as Professor Hugh Pennington, president of the Society for General Microbiology, have suggested a figure of two million. Waving the shroud of the 1918 pandemic, a medical correspondent for the BBC recently put the figure at 11 million.

Early reports suggested that avian influenza killed about 90 per cent of its human victims. Available figures suggest a lower rate of around 50 per cent – among the 118 known cases of avian flu there have been 60 deaths. But even this figure may be misleading.

First of all, we simply don't know how many people in the world have genuinely been infected with avian flu, nor do we know how many may have had mild or asymptomatic flu as was the case in a handful of Japanese workers. We don't know how many people are naturally carrying antibodies to H5N1, though such studies as exist suggest that as many as 38 per cent of the population may already be immune.

Surveillance in many parts of Asia is far from comprehensive. Keeping track of people who have died is relatively simple, keeping track of those who carry the virus and either do not become infected or only have minor symptoms is much more difficult. In many poorer regions the combination of a lack of good roads and express mail systems, too few trained technicians and inadequate laboratory facilities makes it impossible to establish reliable data. In addition, establishing a true death rate depends on governments' honesty in overcoming fears about losses from decreased tourism and trade, and reporting all known cases. This honesty cannot be taken for granted.

Secondly, it is worth remembering that to this day scientists cannot agree on how many people actually died in the 1918 pandemic. Estimates range from 20-100 million – an absurd margin of error. On the whole it is accepted that the 1918 pandemic had an average death rate of around two per cent of those infected

– with mortality significantly higher among the poverty stricken and undernourished and lower among the healthiest people. The last two pandemics, in 1959 and 1967, killed one and two million respectively – a trend that is a far cry from the 50 per cent death rate predicted for a potential avian flu pandemic.

Scientists are currently studying the 1918 pandemic in order to better understand the potential threat posed by H5N1. Unfortunately the 1918 virus was never isolated in its entirety so, in an act of Jurassic Park science, US researchers working with the military have spliced together incomplete pieces of the virus with those from another strain, and have created an entirely unique strain of human super-virus that they say will help them understand the structure, virulence and transmissibility of H5N1. However, it's hard to see what this flashy genetic hocus pocus, akin to studying bananas in order to better understand tomatoes, will achieve.

Looking for links between the putative 1918 human virus and the current avian virus also distracts us from the fact that the unusual virulence of the 1918 virus had more to do with the fact that it evolved amid the unique mayhem of World War I. Crowded, unhygienic conditions – tens of thousands of troops stuffed into transport ships, trenches and military hospitals – favoured the mutation and spread of the highly virulent, easily transmissible virus.

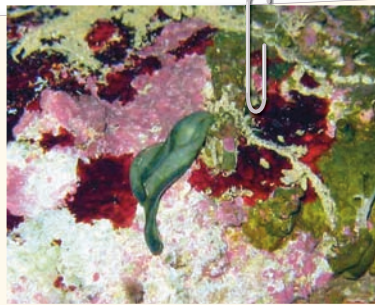
Most of us are asking: 'What if the experts are right?' The other equally relevant question, 'What if the experts are wrong?', hasn't attracted much serious attention. Can we say with any certainty that the pandemic is on its way? And if it is, can we say with any certainty that H5N1 will be the cause? All the available evidence suggests that we cannot. In the meantime, governments throughout the world are investing hundred of millions in drug stockpiles and waging an ongoing and totally ineffective war against nature – a war that ignores the value of the human immune system in fighting disease and which may, in the end, bring us closer to the pandemic we fear so much.



Dear Dr. Tatiana

There's been a frightful accident. I was happily sitting in my usual spot at the bottom of the sea when I felt an itch on my nose. Being a green spoon worm, I don't have arms and I couldn't scratch. So I snuffed. And I inhaled my husband. I've tried sneezing, but he hasn't reappeared. Is there anything I can do to get him back?

Too Much Heavy Breathing near Malta



Dear 'Too much heavy breathing near Malta'

There, there, it's no use crying over snuffed husbands. He wanted to be snuffed, and he's not coming back. By now he'll have assumed his position in your androecium – literally 'small man room' – a special chamber in your reproductive tract where he can sit and fertilise passing eggs. How does he fit? The little chap is 200,000 times smaller than you: it's as if a human male were no bigger than the eraser on the end of a pencil. You could keep a score of husbands without trouble.

But you mustn't disdain your diminutive lover. It's only by chance you escaped his fate. When a green spoon worm larva first hatches, it has no sex. Instead, its sex is determined by the events of its first few days. If, during this

time, the larva encounters a female, it becomes male. If, after about three weeks, it hasn't, it settles into a comfortable crevice and becomes female itself.

This probably sounds amazing. However, before talking about the strangeness of your sex life in more detail, I'd like to highlight phenomenon that's even more peculiar. You'll probably agree that 'male' or 'female' is one of the most basic attributes an organism can have: after all, males and females reliably occur in millions of species. So you might imagine the way a creature becomes male or female varies little from one species to the next, and that you're unique. You'd be wrong on both counts. Surprisingly, an organism's sex is determined in ways that vary enormously. And you green spoon worms aren't the only ones whose sex is determined by social milieu.

Crazy chromosomes

Broadly speaking, sex is determined either by genetic or by environmental factors. Within these two categories, however, there are all sorts of possible variations, many of which have evolved over and over again. For example, one of the most common ways sex is decided is by special chromosomes. Among mammals, males have an X and a Y chromosome, females have two X chromosomes. For birds, the situation is reversed. Males have two Z chromosomes, females have one Z and one W. Fruit flies have XY males; butterflies have ZW females. Lizards swing both ways: some species have ZW females, others have XY males. It's crazy – and that's just the chromosomes. I haven't even mentioned all the critters where the males hatch from unfertilised eggs – a system thought to have evolved at least 17 times – let alone species where sex is determined through horribly complicated

interactions of many different genes.

What about environmental factors? For many reptiles, what matters is the temperature at which their eggs are incubated. Thus, in alligators (and in still more lizards), you get girls when eggs are buried in cool sand and boys when the sand is warm. For many turtles, it's the other way around. Snapping turtles and crocodiles are even wackier: eggs buried either in mounds of cool sand (around 20°C or 68°F) or hot sand (40°C or 104°F) hatch out girls, eggs buried in warm sand hatch out boys. Odder still, in *Stictococcus sjoestedti*, a tropical insect that sucks the sap of cocoa trees, eggs infected with a particular symbiotic fungus become females, uninfected eggs become males. And then, there are those like you whose sex is determined by social circumstance.

For many individuals, this involves changing sex. In one species of *Capitella*, a worm partial to sewer sludge, males turn into hermaphrodites if they fail to encounter a female within a certain time. In the slipper limpet *Crepidula fornicata* (a notorious pest of oyster beds), everyone starts as a male. A fellow who finds himself alone, however, quickly turns into a female and starts attracting mates. Other slipper limpets pile on, gradually forming a louche limpet stack. In slipper limpet sex, it's males on top: although small, they have splendidly long penises so they can fornicate with the female at the bottom. But as the stack continues to grow, the guys who were once at the top of the heap find themselves in the middle and change sex, reabsorbing their penises in the process, to become female.

More exotic still is the marine worm *Ophryotrocha puerilis*. If two females find themselves together, the smaller one changes into a male. But because females grow at a slower pace than males, the male will soon become the larger member of the pair. At this point – shazam! – both individuals change sex. Such reversals happen repeatedly. In the end, though, pairs that have been together for a long time end up by both turning into hermaphrodites. An enviable life.

As a general rule, flexible gender is expected to evolve whenever an individual's reproductive success as a male, female, or hermaphrodite differs greatly according to circumstances. Social



milieu may not be the sole influence at work – if, for example, males can't reproduce successfully unless they are big, it could be advantageous to start life as a female and become male only on achieving a good size. The ability to choose your sex is particularly handy, however, when being one sex leads to a riskier life than being the other.

Risky business

Which brings me back to you. A female green spoon worm takes a greater gamble in life than a male does. She needs two years to mature, during which time she may be eaten by a bat ray, and on reaching adulthood she may never find a mate. So it makes sense for a larva who meets a female to become male: not only is he guaranteed a mate, but he can start reproducing as soon as he's installed himself. What is it about you that makes a larva want to be a man? Well, your lovely bulbous body – but particularly your long, twitchy proboscis – secretes a substance known as bonellin, after your formal name, *Bonellia viridis*. A whiff of bonellin makes any larva stand up and fly right.

But what you're really dying to know, I suspect, is why your lovers are so minute: what strange circumstances prompt natural selection to reduce a man to a testicle? Two factors are thought to be conspiring here – the first is if females are sedentary, the second if they are sparsely sprinkled across the landscape. Then a male's biggest challenge is finding a mate.

The smaller he is, the faster he can mature (he doesn't have to waste time growing) and the sooner he can start looking.

This size business is not just a quirk of green spoon worms: Lilliputian lovers appear in widely separate groups. Take anglerfish, monsters that live in the coldest, deepest seas. The females don't swim much but float in the darkness, ready to ambush their prey. Like wreckers of old, these formidable girls have special dangles and lanterns to lure the curious to their doom. Victims are swallowed whole, engulfed by toothy mouths and grossly distensible stomachs. Like your hubby, male angler fish are minute. But these guys win the all-species Cyrano de Bergerac Award for the largest nose in proportion to body size. Presumably, the males follow their noses to find females in the vast deep. When they meet one, they bite into her leathery black underbelly and fuse with her body, becoming a permanent appendage, little more than a pair of gonads. Still, their fate isn't quite as ignominious as a life sentence in your small man room.



Readers of *The Ecologist* can buy Olivia Judson's book (left) for the special price of £6.99 plus free p&p. To order, call **01206 255800** and quote the reference 'Ecologist'

The elephant in the room

BY AIDAN RANKIN

Economic growth is worshipped like a god – blindly and without any concern for reason.

'Religion is the opium of the people' is one of Marx's best-known aphorisms. It is memorable because it tells us so much about the manipulation of faith in the industrial era, when it was often used to induce passive conformity to business interests. Before he became fixated on the class struggle, Marx showed an ecological consciousness remarkable for his time. He spoke of the need for 'the genuine resolution of the antagonism between man and nature', which is as good a definition of eco-philosophy as any. If the young Karl Marx were writing today, in the era of globalisation, it is likely that he would recognise the new opium as economic growth. For growth has become the Alpha and Omega of political discourse, the place where 'right' and 'left' converge, the goal for which activists of both camps become cheerleaders.

Economic growth has effectively become an official religion. Its theology is uncomplicated, calling to mind the 'cargo cults' that enjoyed brief popularity on South Sea islands during the mid-twentieth century. These cults did not offer salvation in the form of 'pie in the sky', but as consumer luxuries on earth delivered by miraculous ships. The ideology of growth is based on similar superstitions. It is revealing to hear economists who pride themselves on their secular rationalism speak of a 'hidden hand' directing our lives, as if economic policies and structures were not of really of human origin. Likewise, the 'trickle down effect' beloved of growth economists is as elusive as the luxury-bearing ships of the cargo cults.

Wealth does not mysteriously cascade from the rich to the poor, or from richer to poorer nations. If anything, the pursuit of economic growth makes global and regional inequalities more obvious and extreme. And yet policy-makers and campaigners remain in thrall to the idea that trickle down might one day take place, and that an invisible hand might somehow fashion order out of economic chaos.

Growth is the altar before which it is legitimate to sacrifice any number of individual livelihoods, along with local communities, cultural diversity and all manner of skills, craftsmanship and accumulated wisdom. The planet itself has become the ultimate sacrificial

victim, for the principles of conservation and growth are diametrically opposed and the gulf between them is growing. Economic growth has become a secular fundamentalism, placed above critical comment because to criticise it would be to question an entire worldview.

To be opposed to growth is to be politically eccentric at best. However, it is also to be a heretic or (worse still in these pseudo-egalitarian times) an elitist, willing to deprive others of the 'benefits' of all the consumer goods we take for granted. Critics of growth are accused of denying their fellow humans the inalienable right to ever-increasing living standards, regardless of the planetary or social costs.

Where issues of development are concerned, the charge of elitism has the sharpest sting, and acts as the most effective silencer. The critic of growth is portrayed as standing between the world's poor and material liberation. Growth is identified with opportunity and choice for all, with 'the future' and historical inevitability. Opposition to growth is seen as restricting choice in favour of 'romantic' notions about the past. It is depicted as the preserve of privileged Canutes, trying to turn back the tide of progress. Many economists and more thoughtful politicians from all parties are profoundly worried by the environmental and social impact of continuous growth. But few dare to challenge the orthodoxies of development and progress head-on. Few bring themselves to think the apparently unthinkable – that growth itself is the root of the problem.

As well as a substitute for religion, growth has become an addiction, affecting millions of people individually and shaping mass behaviour. This was brought home to me recently by a neighbour in Yorkshire, who has lived on incapacity benefit for some years and has had difficulties with rent and household bills. On seeing my sitting room and kitchen, his response was to reel off a list of fashionable consumer goods and gadgets, expressing dismay that I did not have them and had no wish to acquire them. He claimed to be unable to 'live' without a plasma television screen.

Some readers might wish to turn this story into an argument against the benefit system,



but this would be to miss the point entirely, for the dependency was not on welfare, but on the products of economic growth. My friend's inability to 'live' without the latest consumer goods can be likened to a heroin user's craving for the next fix. Like the addict, his satisfaction is only ever fleeting, but to feed his habit he will risk financial meltdown. This process crosses the divisions of class and income, and is replicated on a global scale as poorer regions struggle to catch up with the West.

The drug addict thinks in the short term, forgetting about the harm to his or her body or the destruction of friendship, love and trust that the habit inevitably entails. In the same way, the growth addict ignores the damage to the planet and the erosion of any sense of civilised community that arises from the relentless drive for economic expansion. The products of growth never satisfy the individual,

and the pursuit of growth makes societies increasingly dysfunctional and destroys the possibility of global co-operation. Growth creates the illusion of potential abundance, but makes inevitable a dog-eat-dog competition for ever-more scarce resources. The principal casualty is the planet and the only true beneficiaries are economic elites.

Growth's hold over the modern sensibility is such that the pursuit of material abundance is assumed to be identical to the pursuit of happiness. This is despite survey after survey showing that the more 'affluent' we collectively become, the more susceptible we are to stress, insecurity and gnawing discontent. It is tempting to ascribe uncritical worship of growth to the dominant neo-liberal ideology, with its overt adulation of market forces and its indifference to environmental concerns. Yet the movements that style themselves as progressive

“ If Karl Marx were writing in today's era of globalisation, it is likely he would recognise the new opium as economic growth ”

ILLUSTRATION BY ADRIAN TEAL

Piotr Naskrecki

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buy in equally to the growth illusion. For, in effect, today's left subscribes to the trickle down theory just as much as the right. It clings to the belief that growth is essential, so that all should have 'access' to wealth. This approach ignores the finite nature of the earth's resources, as well as the observable truth that accelerating growth gives rise to inequalities that spiral out of control.

Most environmentalists identify with the 'progressive' wing of politics. Although the effects of growth disturb them, they still associate it with opportunity, choice and redistribution of wealth, rather than the realities of impoverishment and despoliation. Therefore, they sidestep the question of growth itself and focus on single-issue campaigns. Such an approach prolongs the delusion that we can tackle climate change, protect fragile ecosystems and the rights of indigenous peoples, or preserve local economies from the homogenising forces of globalisation – and still have a growth-based economy. Some environmental campaigners speak of 'sustainable growth', which is as much a contradiction in terms as 'democratic centralism' in the old Soviet Union. For the green movement, as much as mainstream politics, economic growth remains the elephant in the room.

It is scarcely surprising that the political class, including environmentalists, are in a state of denial. The move away from growth would be as radical as the transition from an agrarian to an industrial economy. But despite the prevalence of growth addiction, there is a politically untapped sense that something is deeply wrong with the assumptions that underpin our economy. The effects of growth mania on the environment, the climate and relations between human beings have become obvious enough to be alarming, even to those who have previously been sceptical about the ecological crisis. Here, paradoxically, there are grounds for hope. Politicians who challenge consensus and face up uncomfortable truths are respected and often successful, albeit after years in the wilderness. The most uncomfortable truth of all is that the time to address the effects of growth addiction is running out. To put it simply, we need to learn to consume less. This is something that the electorate knows in its collective bones, but we await the politician who will dare to say it.

■ Aidan Rankin is writing a book on Jainism's relevance to the West.

Dead babies

Irina Ermakova, a leading scientist at the Institute of Higher Nervous Activity and Neurophysiology of the Russian Academy of Sciences (RAS), added GM soy flour to the diet of female rats. Other females were fed non-GM soy or no soy at all. The experimental diet began two weeks before the rats conceived and continued through pregnancy and nursing.

Ermakova's first surprise came when her pregnant rats started giving birth. Some pups from GM-fed mothers were quite a bit smaller. After two weeks, 36 per cent of them weighed less than 20 grams, compared to about six per cent from the other groups (see photo over).

But the real shock came when the rats started dying. Within three weeks, 25 of the 45 (55.6 per cent) rats from the GM soy group had died, compared to only three of 33 (nine per cent) from the non-GM soy group and three of the 44 (6.8 per cent) from the non-soy controls.

Ermakova preserved several major organs from the mother rats and offspring, drew up designs for a detailed organ analysis, created plans to repeat and expand the feeding trial, and promptly ran out of research money. The \$70,000 needed was not expected to arrive for a year. Therefore, when she was invited to present her research at a symposium organised by the National Association for Genetic Security, Ermakova wrote 'Preliminary Studies' on the top of her paper. She presented it on October 10, 2005 at a session devoted to the risks of GM food.

The soy she tested was Monsanto's Roundup Ready variety. Its DNA has bacterial genes added that allow the soy plant to survive applications of Monsanto's 'Roundup' brand herbicide. Since Ermakova's unique study was small and not yet peer-reviewed, we cannot fairly draw any conclusions as to if or how Roundup Ready soy influences offspring. From what we *do* know about GM soy, however, there are several ways in which it might influence the health of the next generation.

Past studies provide clues

The health of newborns can be affected by toxins, allergens or anti-nutrients in the mother's diet. These may pass through the placenta and impact the development of the fetus. Even the DNA in the mother's food may

BY JEFFREY M SMITH

A Russian scientist planned a simple experiment to see if eating genetically modified (GM) soy might influence offspring. What she got, however, was an astounding result that may threaten a multi-billion dollar industry.

COMMENTS

The smaller rat is 20 days old, while the larger is 19 days old. The mother of the smaller rat was fed GM soy.



be a factor. German scientists found fragments of DNA fed to pregnant mice in the brains of their newborn.¹

The entire field of study about how a mother's diet might influence her offspring was blown open recently by remarkable studies in epigenetics. In a cover story on the August 1, 2003 issue of *Molecular and Cellular Biology*, 'scientists showed they could change the coat color of baby mice simply by feeding their mothers four common nutritional supplements before and during pregnancy and lactation.' The diet actually changed the gene expression of the offspring. The nutritional supplements also 'lowered the offspring's susceptibility to obesity, diabetes and cancer.'² Certainly an altered diet could have the opposite effect.

This raises the risk for pregnant mothers eating GM foods, since the process of creating a genetically engineered crop can create unpredicted toxins, allergens and anti-nutrients. The plant's natural genes can be deleted, scrambled, turned off, permanently turned on, reversed, duplicated, or moved, and the expression levels of hundreds of genes can be altered.³ These changes have never been properly evaluated in the GM crops on the market.

With Roundup Ready soy, years after it was marketed, scientists discovered a section of natural soy DNA that had been scrambled during the gene insertion process.⁴ There were also two additional fragments of the foreign gene that had gotten into the DNA, but had escaped Monsanto's detection. At least one of these fragments becomes transcribed into RNA and may be creating unknown proteins with unpredictable effects.⁵

When mice were fed GM soy, they

developed misshapen nuclei in their liver cells, as well as other cellular anomalies.⁶ The liver is the body's major de-toxifier. The changes indicated increased metabolic activity, probably resulting from a major insult to that organ. Mice fed GM soy also showed changes in the pancreas, including a huge drop in the production of a major enzyme (alpha-amylase),⁷ which could inhibit digestion. Cooked GM soy contains about twice the amount of soy lectin, which can also block nutrient assimilation.⁸ And one study showed that GM soy has 12-14 per cent less isoflavones, which are touted as cancer fighting.⁹

An animal feeding study published by Monsanto showed no apparent problems with GM soy,¹⁰ but their research has been severely criticised as rigged to avoid finding problems.¹¹ Monsanto used mature animals instead of young, more sensitive ones, diluted their GM soy up to 12-fold, used too much protein, never weighed the organs, and had huge variations in starting weights. The study's nutrient comparison between GM and non-GM soy revealed significant differences in the ash, fat, and carbohydrate content, lower levels of protein, a fatty acid, and phenylalanine. Monsanto researchers had actually omitted the most incriminating nutritional differences, which were later discovered and made public. For example, the published paper showed a 27 per cent increase in a known allergen, trypsin inhibitor, while the recovered data raised that to a three-fold or seven-fold increase, after the soy was cooked. In addition to promoting allergies, trypsin inhibitor is an anti-nutrient that may impair protein digestion.

The only human feeding trial ever conducted confirmed that the gene inserted

“Scientists changed the coat colour of baby mice by feeding their mothers four common supplements before and during pregnancy and lactation”



into GM soybeans transfers into the DNA of gut bacteria and may continue to produce its novel protein long after the person stops eating soy.¹² In animal studies, fragments of genetically modified DNA were also found in the blood, spleen, liver and kidneys of piglets that were fed GM corn.¹³ It was not clear if these transgenes were integrated into the animal's own DNA. If they were, it might impact the animal's health, or even the health of those who consume the meat. Moreover, if the transgenes were to integrate into the animal's sex organ cells, that might impact the offspring.

A common feature of GM research is that when incriminating evidence surfaces, it is not followed up. The biotech industry controls most of the research money and has been able to make excuses for the adverse findings. Ermakova's research, however, will likely change that. That's because her study is easy to repeat and its results are so extreme. A 55.6 per cent mortality rate is enormous and very worrisome. Repeating the study is the only reasonable option.

AAEM urges follow-up study

I presented Dr. Ermakova's findings, with her permission, at the annual conference of the American Academy of Environmental Medicine (AAEM) in Tucson on October 27, 2005. In response, the American Academy of Environmental Medicine (AAEM) board passed a resolution asking the US National Institutes of Health (NIH) to sponsor an immediate, independent follow-up of the study.¹⁴ Dr. Jim Willoughby, the Academy's president, said, 'Genetically modified soy, corn, canola, and cottonseed oil are being consumed daily by a significant proportion of our population. We need rigorous, independent and long-term studies to evaluate if these foods put the population at risk.'

Unfortunately, there is a feature about GM crops that may make follow-up studies unreliable. In 2003, a French laboratory analysed the inserted genes in five GM varieties, including Roundup Ready soybeans.¹⁵ In each case, the genetic sequence was different than that which had been described by the biotech companies years earlier. Had all the companies made a mistake? That's unlikely. Rather, the inserted genes probably rearranged over time. A Brussels lab confirmed that the genetic sequences were different than what was originally listed. But the sequences discovered in Brussels didn't all match those found by the French.¹⁶ This suggests that the inserted

genes are unstable and can change in different ways. It also means that they are creating new proteins – ones that were never intended or tested. The Roundup Ready soybeans used in the Russian test may therefore be quite different from the Roundup Ready soybeans used in follow-up studies.

Unstable genes may also explain some of the many GM-related problems I reported in last month's issue of the *Ecologist*. The sterile pigs, dead cows, or mysterious disease in the Philippines, may have resulted from GM crops that had 'gone bad' due to genetic rearrangements. In fact, even GM plants with identical gene sequences might act differently.¹⁷

If regulators officially acknowledged that GM crops were unstable, that would likely cause the foods to be withdrawn from the market. But so far, regulatory agencies have largely ignored the growing body of adverse findings and not dared to threaten the billions of dollars invested by the biotech industry. It may take some dramatic, indisputable and life-threatening discovery. That is why Ermakova's study is so important. If the results do hold up, it may topple the GM food industry.

I urge governments and foundations around the world to immediately conduct rigorous, independent follow-up studies. This is not the time to wait. There is too much at stake.

■ Jeffrey M. Smith is working with a team of international scientists to catalogue all known health risks of GM foods. He is the author of *Seeds of Deception*, the world's bestselling book on GM food, and the producer of the video, *Hidden Dangers in Kids' Meals*.

All the references for this article can be found after the online version that appears on our website www.theecologist.org

“ A 55.6 per cent mortality rate is enormous and extremely worrisome. Repeating the study is the only reasonable option. ”

Goose? Or propaganda?

BY MALCOLM
TAIT

When governments try to reassure the public with announcements about how much they are doing to solve problems like bird flu or global warming, it just avoids the real question – how did we get into this mess in the first place?

“ This is what happens when you hire a man with no vision to assume a pre-eminent role in a changing world. ”

*Christmas is a-coming
The geese are getting flu
Please to have a jab
Or it's the end of you*

At the beginning of November, US President George Bush unveiled his plan to protect the people of his country against the possible threat of bird flu. It was a simple plan: he called for \$7.1 billion to be set aside to stockpile drugs, vaccines, and develop new technology to combat the disease. That's an awful lot of money to combat a viral form that, as far as we know, doesn't even exist yet. In her article on page 14, Pat Thomas discusses at length the likelihood of the virus mutating into a form that can be transmitted by the human population. So if we don't yet have anything to cure, shouldn't much of the effort go towards preventing an outbreak in the first place? Towards finding ways of containing the virus before it mutates? Towards compensating those many farmers around the world whose livelihoods will be lost through the slaughtering of their stock?

Of that \$7.1 billion, a mere \$250 million has been set aside for containment of the disease outside America. That's about 3.5 per cent of the overall package: 3.5 per cent for prevention of a disease that doesn't yet exist, 96.5 per cent for a cure should it happen.

These are Bushian principles at their very best and, global warmongering apart, are what will characterise his presidency once these frightful eight years are over. Ignore a drama until it turns into a media crisis, then throw big bucks at it to show what a great firefighter you are. He did nothing to prepare when warned that a hurricane might ravage his country's east coast; he ignored warnings that NASA's space shuttle programme was under-funded and unsafe until the Columbia disaster occurred in 2003; he has repeatedly pooh-poohed scientific insistence that the world is under threat from global warming. This is what happens when you hire a man with no vision to assume a pre-eminent role in a changing world. Incapable of genuine reform and constructive action, those intangible betterments that take years to bear fruit, he will seek quick-fix victories to temporary, often self-made battles in order to

maintain his standing.

Meanwhile, as Bush fiddles with the so-called threat of terrorism, the threats of true natural disasters continue to burn. Bush might like to think of himself as the Arnie Schwarzenegger of international politics – storming into town with guns blazing and shooting all the bad guys – but this isn't Hollywood, this is the real world, and life continues well after the closing credits roll.

Even Arnie gets that. In California, the muscle-bound governor is taking action of his own. He has set a target of forcing car manufacturers to cut greenhouse gas emissions by a third over the next decade. There will be legal challenges of course, and he's a long way from getting the legislation through, but it's a bold step. And he's not alone. No fewer than nine states, including New York, have declared that they will set legal limits on emissions from power stations, while a consortium of mayors, representing 40 million people across the country, have announced that they intend to adopt Kyoto targets to reduce harmful emissions.

This isn't just based on a desire simply to do the right thing, of course. Many American multinational companies are realising that as the world moves towards a low-carbon rating, they'll get left behind in the international marketplace. The Bush administration might not be listening, but the federal network is beginning to.

Ten states have already pledged to try to make a difference and, without doubt, others will follow. Suddenly, the scientific and popular concern about global warming has mutated into a political concern in America, and is spreading very rapidly, infecting more and more of the political population of the nation's federal structure, undermining national government in the process.

This will be a remarkable test of Bush and his Republican administration. They will not be able to ignore the spread of ideological change through their nation, and neither, for fear of isolating themselves, will they be able to fight it.

Right now, they must be feeling pretty sick.

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An aerial photograph of the salt terraces in Maras, Peru. The terraces are carved into the natural rock formations and are filled with a yellowish-brown brine. In the foreground, a worker wearing a green shirt and a hat is bent over, working on one of the terraces. Next to the worker are several large white bags of salt, some with the 'Ultrasol' brand name visible. The overall scene is a mix of natural rock and human-made agricultural structures.

Half way between Cusco and the lost city of Machu Picchu lies the ancient artery of Inca trade and production – the salt terraces. For over 1,000 years little has changed for the salt farmers of Maras. Now, thanks to a clumsy, unnecessary and potentially dangerous attempt at mass medication, this traditional livelihood is at risk.
By James Frankham.

SALT OF THE EARTH



It looks like a vast marble staircase: 4550 terraces of salt, tumbling down the hillside to the town below. As the mineral-rich water runs from one evaporation pool to the next, it colours each differently, from subtle greens to ochres and greys. Some glisten white like snow, first-grade salt ready to be harvested. Others are tawny puddles still being warmed by the sun. It is also the only place on the planet where salt is harvested on terraces rather than evaporated from sea-water pans.

For centuries the farmers sold the salt in the towns and villages throughout the valley. Until recently they were making 12 soles (£2) a bag. Then in 2002 the government decreed that all salt must be iodised, and the farmers were required to sell their stock to Sal Yodada Marasal, 'The Company', for processing. Now they receive between 3.50 and 6 soles for 50 kilograms less than £1 for each sack.

It's a meager income, even in Peru.



Camilo and Jose have tended their baños several times in the last month; adding water, harvesting the salt and grading it into three classes required by The Company: Extra, for consumption, primera for baking and tercera which is used for animal feed and fertiliser. Between them they have carted nearly three tonnes of salt to the depot this morning, the month's net product. It will earn them around 40 soles (£6.90) each for their families.

William Flor sifts salt from the terrace he has worked since a child into a pile that will be shovelled into 50kg sacks.



IODISING SALT...IS IT NECESSARY?

In 1995 the World Health Assembly adopted the concept of universal salt iodization (USI) – the iodization of salt for human and livestock consumption – in order to eliminate iodine deficiency disease (IDD) and its related disorders such as goitre, cretinism and neurological disorders in children and myxedema in adults. As a result countries around the world, including Peru, now routinely require all salt to contain added iodine.

The problem is that iodising salt is a crude form of prevention more appropriate for those living in conditions of famine. People eating a relatively well balanced diet are not at risk of iodine deficiency because iodine is widely available in sea fish, shell fish, eggs, cereal grains, legumes and dairy products from cows fed with iodised salt. Certain food additives also contain iodine.

Enforced medication with iodized salt adds greatly to our iodine intake and as a result people in the West are risking iodine overload. As much as 75 per cent of the body's iodine is stored in the thyroid gland and is used for the production of hormones that regulate metabolism. Too much iodine and levels of these hormones can become dangerously unbalanced, leading to metabolic as well as immune disorders.

In Japan and the US, where intake of iodized salt is highest, the problems of excess iodine are responsible for serious problems such as thyroiditis (inflammation of the thyroid) and hyperthyroidism (an overactive thyroid), which can produce, among others, symptoms of increased heart rate and blood pressure, abnormal heart rhythms (arrhythmias), excessive sweating, hand tremors, nervousness and anxiety, and difficulty sleeping (insomnia).





After a month's working on the terrace, the farmers load the raw salt onto the backs of donkeys, to then be carried up the hill to the warehouse of Sal Yodada Marasal, 'The Company' as it is known. Half a world away the product of their families sells as 'Salt of the Incas' in the supermarkets of Japan for around £1.40 for a one kilogram bag. In between, someone is making £1.37 on that kilogram of Maras salt. Meanwhile the 300 salt workers, already some of the poorest workers in Peru, receive just 2 per cent of the product's market value to feed their families.

BEHIND THE LABEL

AIR FRESHENERS

Do you like to freshen up your house with a good squirt of air freshener or get your elbow behind some spray polish? Beware, that waft of scent can mask a multitude of harmful ingredients. BY PAT THOMAS

In addition to cosmetics, future editions of Behind the Label will be looking at ingredients in food and others types of household goods. We welcome all suggestions from readers for products that need peering into. Write to or email pat@theecologist.org.

Not all labels are easy to look behind. Household products such as cleaners, polishes and air fresheners are not obliged to list their ingredients and from a health perspective this maybe a costly omission

In spite of their name, air fresheners do not freshen the air. Instead strong long-lasting perfumes mask odours while other chemical ingredients alter your sense of smell making it less acute.

In Britain our air fresheners generate sales of around £300 million annually. In America, 80 per cent of households use 'home fragrances' regularly and spend around \$8.4 billion (£4,700 million) a year. SC Johnson (Glade), Sara Lee (Ambi-Pur) and Reckitt Benckiser (Air Wick) are the market leaders around the globe.

30 – 40 per cent of air freshener purchases are driven by what marketers call "home cleaning replacement". Time-strapped, people clean less often or less thoroughly, and so use air fresheners to give a 'just-cleaned' impression. The promise of luxury and a quick-fix mood-enhancement also boost sales.

Yet in 1999 a British survey of 14,000 pregnant women concluded that frequent use of household aerosol sprays and air fresheners was making women and babies ill.

The study, reported in *New Scientist*, found that women who used aerosols and air fresheners most days suffered 25 per cent more headaches and 19 per cent more postnatal depression than those who used them less than once a week; their babies had 30 per cent more ear infections and more frequent diarrhoea. The same scientists updated their findings this year in the *Archives of Environmental Medicine*, with much the same results.

Earlier this year the Bureau European

des Unions de Consommateurs (BEUC) published a comparative study into home fragrances and measured the concentration of volatile organic compounds (VOCs) and aldehydes in the air after their use.

VOCs and aldehydes are potent neurotoxins that attack the central and peripheral nervous systems. The study found that air fresheners released toxins such as acetaldehyde, styrene, toluene, glycol ethers, phthalates and artificial musk into the air. Traces of formaldehyde and benzene were also found.

In many cases levels of potent toxins such as acetaldehyde, styrene, toluene, chlorobenzene, glycol ethers, phthalates and artificial musk into the air were much higher than the 'safe' VOC dose of 200 µg/m³ (micrograms per cubic metre). In some cases they were as high as 4000–5000 µg/m³. Traces of formaldehyde and benzene were also found.

The report had a profound effect on consumers. So much so that Sara Lee took the BEUC to court claiming a 30 per cent drop in sales. The Dutch courts accepted Sara Lee's claim that amounts of each chemical in individual products were low and that 'normal use' of air fresheners was not a health risk.

Sara Lee's argument, of course, failed to take into account the cocktail effect of different VOCs in a single product, the specific vulnerability of children and pregnant women or the persistent nature of many of these chemicals. It also failed to take into account the changing definition of 'normal use' from an occasional spray to continuous release devices or the sheer volume of ambient fragrances we come into contact with each day.



COMMON INGREDIENTS	PURPOSE	ADVERSE EFFECTS
Acetaldehyde	Fragrance constituent, also known as ethanal	Eyes, skin and respiratory irritation; probable carcinogen; flammable. Acetaldehyde is also emitted by cars, factories and cigarettes.
Styrene	Solvent, fragrance constituent	Skin and respiratory irritation; depression, poor concentration, muscle weakness, tiredness, nausea; liver and kidney damage. Reproductive toxin in animals, leukaemia with occupational exposure. Probable human carcinogen.
Toluene	Solvent, fragrance constituent, also known as methylbenzene or phenylmethane	Intoxicating, nausea-inducing. Chronic or frequent inhalation can lead to irreversible brain damage. Flammable.
Chlorobenzene	Fragrance constituent	Anaesthetic effects and impaired liver and kidney function; central nervous system damage.
Solvents	Dissolve, dilute and mix together fragrance chemicals	Liver and kidney damage; birth defects and nervous system disorders; increased risk of Parkinson's disease. All solvents are hazardous; problems develop slowly over time with chronic low-level exposure. Common fragrance solvents include acetone (see also ketones) or ethanol.
Formaldehyde	Preservative	Alters sense of smell. Ear, nose and throat irritation; skin rashes, headaches and persistent flu-like symptoms. Wheezing, asthma and chronic bronchitis, especially in children. Insomnia, impaired memory and poor concentration, nausea and menstrual irregularities. Suspected human carcinogen.
Glycol ethers	Solvents, also known as cellosolves	Dermatitis and hyperpigmentation; oedema; photosensitization. Common glycol ethers in air fresheners include diethylene glycol ethyl ether and ethylene glycol monobutyl ether.
Benzene	Solvent, fragrance constituent	Eye, nose and throat irritation; headaches, loss of appetite, loss of coordination, drowsiness, nervousness and psychological disturbances. Frequent inhalation can lead to cataracts and blood disorders (such as anaemia), and lymphatic as well as bone marrow diseases such as leukaemia in animals. Mutagenic (capable of causing DNA mutations).
HCFCs (hydrochlorofluorocarbons), propane, butane, isobutane	Propellants	Nervous system disorders, skin, eye, throat and lung irritation and liver damage. Highly flammable.
Phthalates	Fragrance constituents	Hormone disrupting reproductive toxins; early puberty in girls, late puberty in boys. Potential carcinogens.
Artificial musks	Fragrance	Hormone-disrupting, reproductive toxins; persistent, bio-accumulative; hazardous to wildlife and aquatic organisms.
<i>NOTE: Space restrictions prohibit full referencing, however Behind the Label draws on data from published studies and reports in medical, scientific and trade journals, government sponsored databases (e.g. the US National Library of Medicine) and relevant Material Safety Data Sheets (MSDS).</i>		

ALTERNATIVES

You don't need air fresheners and the best alternative is not to buy them at all. Simply keeping your home clean and well ventilated solves most odour problems. If you absolutely must spray then make sure you are using natural essential oils and pump, rather than aerosol, sprays:

Oshadhi Home Fragrances
www.oshadhi.co.uk
 Greenfibres home fragrances
www.greenfibres.com
 Mother Earth Room sprays
www.thermustbeabetterway.co.uk

Molo Africa Natural Room Spray
www.auravita.com
 Air Scense
www.21stcenturyhealth.co.uk







NEIGHBOURLESS HOODS

Churches turned into pubs. Brooding Victorian warehouses replaced with sparkly identikit apartments. Family shops and independent cafes bankrupted by Starbucks, Tesco's et al. When will we wake up to this grim, placeless reality?

by **Paul Kingsnorth**



Today was the first true winter day of the year. It was cold and crisp, the sky was ice blue, and yellow leaves were skimming in gusts around the pavement. I felt an urgent need to procrastinate before I began writing this article, so I decided to go for a walk along the canal.

I've always loved the Oxford Canal. In the 10 years I've known it, it's had a glamorously down-at-heel character. It's a place of ramshackle factories and teetering, palatial Victorian houses – all dark red brick and long thin gardens. Old arched bridges and dozens of scruffy residential narrowboats are lined up bow to stern along the banks, their mooring ropes tangled together, their chimneys belching the sweet smell of coal smoke into the cold air. The canal runs right through my neighbourhood, and it makes the neighbourhood

character is being erased in the name of those two trusty old soldiers, progress and economic rationalism

what it is. It has a nature, a character, a personality of its own.

Or it did have. That character is rapidly being erased in the name of those two trusty old soldiers, progress and economic

rationalism. Up and down the towpath, their marks can be seen. Where once there was a long strip of 'waste' ground, there is now a building site, on which tall new flats have risen in less than a year, like sunflowers on a prairie. Where only recently was a working boatyard is now an empty acre of concrete and unused sheds, where more executive flats will soon rise. Where once was a line of moored residential narrowboats is now a line of worried boaters, recently informed that their mooring fees will be more than doubled, and that if they don't like it they can, well, buy one of the new flats. As if they could afford it.

And today, the old factory is breathing its last. Beside the waterfront, its walls and windows are shuttered with the scaffolding of demolition crews, here to tear down what remains of its old shell. Of everything that has happened to the canal, somehow, and for some reason, it's the last gasp of this industrial relic – this wonderful and strangely disturbing old landmark – that affects me the most.

W. Lucy and Co began operating the Eagle Ironworks, on the edge of the Oxford Canal, in 1812. For nearly two centuries they designed and cast whatever the city needed, and stamped it with their name. Drain covers, palings, church gates, street lamps and a hundred odd, small, necessary, unnoticed things came daily from the works, through the cast-iron gates crowned with their eagle-head logo. Their great skulking,

redbrick factory has towered over the canal for two centuries, its cracked and smeared windows, florid gates, cobbled yard and asymmetrical buildings a curious, wonderful and slightly disturbing presence.

Not any more. The Lucy ironworks, so cobwebbed and intriguing, so distinctive and apparently timeless, is to become yet another gated complex of luxury flats. This quirky, entirely unique old building is to be replaced by one that could be mistaken for any building, anywhere: spruced up, divided, polished, sucked clean of all dirt, danger and character and made fit for commuters in silver cars who work in London. As the factory dies, so too does a part of the canal, the boatyard, the neighbourhood and the wider city.

Something is happening here, and nobody seems to want to talk about it.

Who cares about any of this, and why should it matter? It's easy, after all, to lament change, and easy too to forget that change is the only constant. The old Lucy factory was polluting, messy and, finally, uneconomic. New housing is urgently needed, and it surely has to be better to build it on old industrial sites than in the green belt. Had I been walking along the canal when the factory and boatyard were being built, I would no doubt have lamented that too. If there's one thing the English have always been good at, it's lamenting.

The cost of 'progress'

Maybe. But this is not the real story, for what is happening just around the corner from me is probably also happening just around the corner from you. It's not isolated, it's not irrelevant and it's not to be dismissed. It is part of something wider – a larger, and more significant trend, which is sold to us as 'progress', but is actually something very different.

Put simply, the things that make our towns, villages, cities and landscapes different, distinctive or special are being eroded, and replaced by things that would be familiar anywhere. It is happening all over the country – you can probably see at least one example of it from where you're sitting right now. The same chain stores in every high street, the same bricks in every new housing estate, the same signs on every road, and the same menu in every pub.

What these changes have in common is this: in each case, something distinctive is replaced by something bland; something organic by something manufactured; something definably local with something emptily placeless; something human-scale with something impersonal. The result is stark, simple and brutal: everywhere is becoming the same as everywhere else.

The small, the ancient, the indefinable, the unprofitable, the meaningful, the interesting and the quirky are being scoured out and bulldozed to make way for the clean, the sophisticated, the alien, the progressive, the corporate. It feels, to me, like a great loss – a hard-to-define but biting loss, which seems to suck the meaning from the places I care for or feel I belong to. It matters.

Why? Because in the name of economic efficiency, the things that really matter in life – the texture, the colour, the detail, the complex web of intimate relationships between people and communities and the landscape they inhabit – are being dismantled, with nobody's permission. Because our landscape is being rapidly and thoughtlessly remoulded to meet the short-term needs of a global economy that is built on sand. And because what we are losing, in the name of progress, is being replaced, in most cases, with things that are not better, but worse.

A sense of place

What we are losing is something that is uniquely, exquisitely small, local and impossible to define: a sense of place. It is a sense of place that binds healthy communities together, and distinguishes living cultures from dead ones. It is a sense of place that makes the difference between a country that is worth living in and one that isn't. And the paradox is that this galloping destruction of local distinctiveness has very global roots – for it is primarily the ever-expanding global economy that is responsible.

Put crudely, a global market requires a global identity; not just goods, but landscapes themselves must be branded and made safe for the universal act of consumption. A global market requires global tastes – we all have to want the same things, feel the same things, like or dislike the same things. Only that way can markets cross cultural boundaries. At the same time, an advanced industrial economy requires economies of scale – which means mass production, the smoothing-out of edges, uniform and characterless development; the standardised manufacture of entire landscapes.

In order for the consumer economy to progress, we must cease to be people who belong to neighbourhoods, communities, localities. We must cease to value the distinctiveness of where we are. We must become consumers, bargain-hunters, dealers on a faceless, placeless international trading floor. We must cease to identify with place, or to care about it. We must cease, finally and forever, to belong to the land.

This loss of a sense of place – this loss of place itself – is both widely felt and largely unmentioned. While very large numbers of us can



see this happening, and are concerned about it, few people join the dots – or feel they are allowed to. In every local paper, in every local pub, in every community centre, every week of the year, people will be discussing these issues – at a very local level. This new housing development, that new megastore, this street market closing down, the list goes on. People know something is wrong; they just don't know quite what, or why, or what to do about it. And if they complain, they are told by the political classes, and often by the media and its associated pundits, that none of this really matters.

They are told that these are small, insignificant local issues, of no import in the grand scheme of things. They are told to think about something more important: economic growth, perhaps, or the War on Terror. And if they persist, they are called 'nimbys', and pigeonholed as reactionaries or nostalgic idealists. No one, runs the subtext, has the right to take up arms in defence of their place, their sense of belonging, their attachment to a locality. We should all have better things to do.

Getting the message loud and clear

But there are surely few better things to do. And the good news is that an increasing number of people seem to know it; and are starting to say it, loud and clear.

Some of this good news is on show back on the Oxford Canal. A few hundred yards down from the shivering shell of the old ironworks lies Castlemill Boatyard.

Owned, like the canal itself, by the government body British Waterways, Castlemill has been the site of a fierce local battle for over a year. British Waterways, against the will of the local community and virtually all the boaters on the Oxford Canal, has closed Castlemill, which operated vital repair and maintenance services for canal boats, and

We must become consumers, bargain-hunters, dealers on a faceless, placeless trading floor

LOCALISATION

wants to sell the site for – yes, you guessed it – luxury housing and a slick waterfront restaurant. It had already struck a deal with a housing developer, Bellway Homes, before it closed the yard down. Planning permission was to be just a formality. British Waterways, supposed guardians of the canal network, would pocket £2 million, and the last publicly accessible working boatyard in the city would be no more.

But the locals and the boaters fought back, mounting a fierce campaign to save the boatyard. It led to planning permission being turned down by the city council. British Waterways appealed, and a long planning inquiry was held, which BW and Bellway Homes stuffed with

expensive taxpayer-funded lawyers – and lost again. Undeterred, BW moved in and ejected the boatyard's tenant, whose lease with them had run out – only to have the yard occupied by the boaters themselves, who are still there, refusing to leave and vowing to take British Waterways all the way to the high court.

'What they are is asset-strippers,' says Matt Morton, an ecologist and former boater who is now leading the fight to save the boatyard. 'British Waterways are supposed to be guardians of the network. They're nothing of the sort – they're scouring the canals, looking for land they can flog off for expensive housing, to cover a hole in their finances caused by a government funding cut. In the process, they're destroying the character of the whole network. They're more interested in shareholders than boaters.'

British Waterways and Bellway, say the Castlemill boaters, want to take this very distinctive place – with its scruffy narrowboat, bounding dogs, welding gear and random piles of wood and metal – and replace it with a non-place; the kind of executive development that can be seen in any town, anywhere in Britain. They are prepared to stand up for this place – and the nomadic, slow, low-impact lifestyle that springs from it – because they believe it matters. In this case, almost everyone else, from the local community centre to the city council, seems to agree with them.

This is just one example, but when you start to look around you see it is one of many, and that the forces ranged against each other are always similar. On one side some sprawling government bureaucracy or corporation – or often, as in the case of Castlemill, both. On the other, a small but determined gaggle of locals, specialist interest groups and people who believe, simply, that something unique is worth fighting for. Often that is all they have in common; but they add up to something.

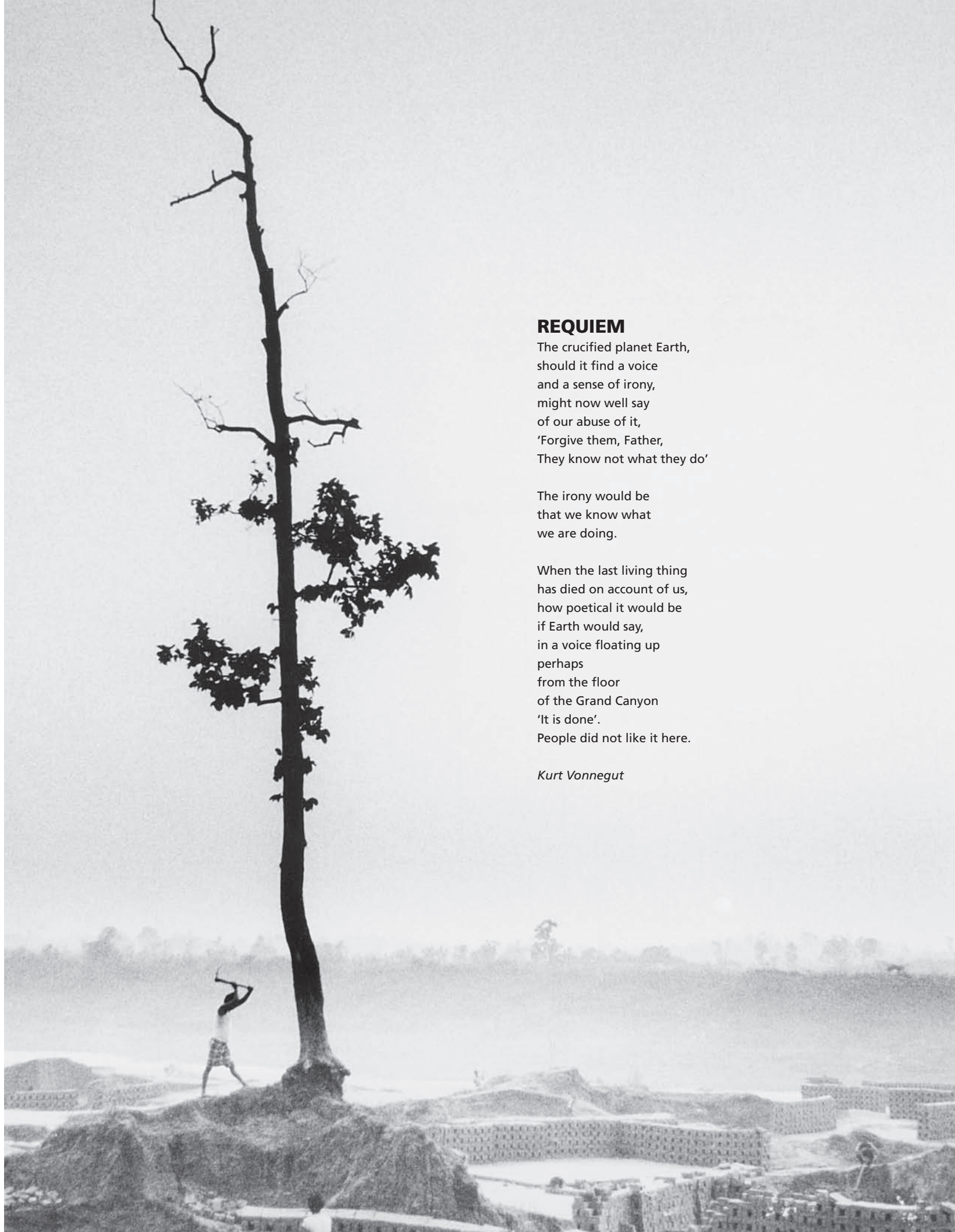
Preparing to fight

All over the UK, for example, you will find communities and individuals working to save their local pubs. You don't get much more of a distinctive marker of place than a local boozer, but thanks to corporate consolidation and dubious legislation, the traditional local is under threat as never before. According to the Campaign for Real Ale, 26 pubs close every month – virtually one a day.

Giant, ever-expanding pub corporations, with names like the Spirit Group and Enterprise Inns, who long ago took over ownership of pubs from brewers, are selling them off for housing



A global market requires global tastes – we all have to want the same things, feel the same things, like or dislike the same things



REQUIEM

The crucified planet Earth,
should it find a voice
and a sense of irony,
might now well say
of our abuse of it,
'Forgive them, Father,
They know not what they do'

The irony would be
that we know what
we are doing.

When the last living thing
has died on account of us,
how poetical it would be
if Earth would say,
in a voice floating up
perhaps
from the floor
of the Grand Canyon
'It is done'.
People did not like it here.

Kurt Vonnegut

A CAMPAIGN TO REVERSE BRITAIN'S COMMUNITY DECLINE

Campaign for a Bill to Make Britain's Communities Sustainable - *An appeal for your help*

Paul Kingsnorth's words have highlighted a massive problem that Britain is facing. Our communities are unsustainable. We all know the problems - loss of local shops and public amenities causing increased travel, loss of local jobs causing increased commuting, most energy provided by national fossil fuel burning power networks, most waste going to landfill, food and other products being sourced from vast distances, poor public transport and ongoing green space development.

It is true that there are local activists fighting to change things, coming together to stop the new superstore being built, to save the post office or to demand better public transport. But all too often they are ignored by local and national government. What is the solution?

The Sustainable Communities Bill

Imagine this - a new piece of legislation, drafted by community organisations and environment groups, that if made law, will turn society **upside down**. Central government will be required to assist in promoting local sustainability in ways suggested by councils and communities (NOT dictated by civil servants in Whitehall).

In short, it is central government having a duty to say "tell us what you need from us in order to assist in making your communities greener" rather than "this is what you must do". This Bill is about community participation not the usual "consultation" in which all the final decisions are made centrally.

SUPPORT FORM

Please indicate the level of your support (any effort you can make will be very welcome) by ticking the boxes below.

- I wish to support this Campaign. Please keep me informed.
- Please send me _____ copies of the campaign's leaflet to distribute.
- I would be interested in organising a local meeting.
- I would like to give a donation to this campaign of £ _____
(Please make cheques payable to Local Works)

Name _____

Address _____

_____ Post code _____

Email _____

Tel _____

MP/Parliamentary Constituency if known: _____

Please return to:

Local Works, 94 White Lion Street, London N1 9PF

Tel: 020 7833 9898, Email: info@localworks.org

or sign up online at:

www.localworks.org

We believe that this is an important Bill for all Ecologist readers.

Because of this approach local citizens will have a much better chance of making their communities more sustainable - e.g. more recycling; local renewable energy; or another bus service; a bureaucratic hurdle removed here; a door opened there; some extra funding for community projects. Local people could feed these ideas into the process, to be set up by this Bill, allowing them to make their local areas more sustainable. That is why the Ecologist, along with 61 other national organisations is supporting Local Works, the campaign behind the Bill.

Your support crucial

It will take a massive grass roots campaign for the Bill to succeed and so your support is crucial. So far 237 MPs have signed supportive motions in Parliament and 8,000 individuals support the campaign. We urge you to please sign the support form. Thank you.

Organisations supporting the campaign include:

National Federation of Womens' Institutes
The Co-operative Group
Friends of the Earth
UNISON
Soil Association
National Pensioners Convention
CAMRA - Campaign for Real Ale
National Association of Local Councils
Public and Commercial Services Union



or converting them into hip bars, identikit chains or eateries. In response, communities all over the country have been banding together to fight closures, and in some cases even buy pubs themselves, to protect them from the asset-strippers. Groups like the Community Pubs Association and Freedom for Pubs are growing larger as the pub companies continue. The local pub means too much to people to allow it to be homogenised into history.

Pubs, boatyards, crumbling factories... people will put up a fight for any number of weird and wonderful local landmarks if they mean enough to them. In London's Chinatown, a coalition of locals calling themselves the Save Chinatown Campaign, are currently crossing swords with yet another developer, the Rosewheel Corporation, which is busy ejecting small Chinese shopkeepers from the area and threatening to knock down the famous pagoda. In Herefordshire and Somerset, campaigners are fighting to protect ancient orchards, bulging with rare and traditional varieties of fruit, from being grubbed up by farmers who can't sell their wares to the ever-dominant superstores.

In Birmingham, urban black communities are working to save their street markets from demolition and replacement by office blocks. In Brighton, locals are fighting to prevent the creation of yet another Starbucks. And in Bury St Edmunds, the fight is becoming something literal, with the formation of a group of anonymous vigilantes, the Knights of St Edmund, who have sworn to defend their town against a new development spearheaded by Debenhams. The company has 18 days to withdraw a plan to redevelop the town centre, say the knights, or they will unleash an ancient curse on the sleepy Suffolk town.

Not everyone is prepared to go this far; but, nationally, plenty of people are prepared to take a stand – it is a long, long list, and it seems a growing one. In a rapidly homogenising world, place, belonging, distinctiveness, and character seem to become more and more important in peoples' lives. Valuing common things, defending detail, understanding culture and landscape and fighting for its integrity in the face of an onrush of standardisation; suddenly, the small things seem terribly important after all.

Perhaps what we are witnessing here is the shy emergence of something newly self-aware: a politics of belonging. All over the country, the extinction of that sense of place is resisted by those on the margins of political debate and economic influence. They are people who refuse to lie down before the juggernaut of a spurious progress, or to sacrifice the landscapes and cultures that matter to

them for the benefit of a global economy that is beyond their control.

Standing up for our places – fighting for them, refusing to let them be steamrollered by the consumer juggernaut; making them *live* again – is something that should be able to unite left and right and everyone in-between. It is something that will annoy politicians of all stripes, and get right up the nose of a global money machine that wants us all to stop moaning, give up and go shopping.

In an age of global consumerism, corporate power and the dominance of a homogenising, placeless, economic ideology, it could be that the one truly radical thing to do is to belong.

■ Paul Kingsnorth's is working on a book about place and the English landscape, to be published by Portobello in 2007. www.paulkingsnorth.net

In order for the consumer economy to progress, we must cease to be people care about neighbourhoods

CAMPAIGNS

Common Ground

Common Ground have a campaign for "local distinctiveness" and believe in giving precedence to local shops, produce and identity, whilst embracing the good points of our multicultural society.

<http://www.commonground.org.uk/>

Tel: 01747 85082

Village retail services association.

The VIRSA promote and support community owned shops, providing various publications and advisory services via a network of experienced local shop owners.

<http://www.virsa.org/>

Tel: 01993 814377

Local Food Works

This website provides access to local food networks across the UK. It is a partnership project between Soil Association and Countryside Agency.

<http://www.localfoodworks.org/>

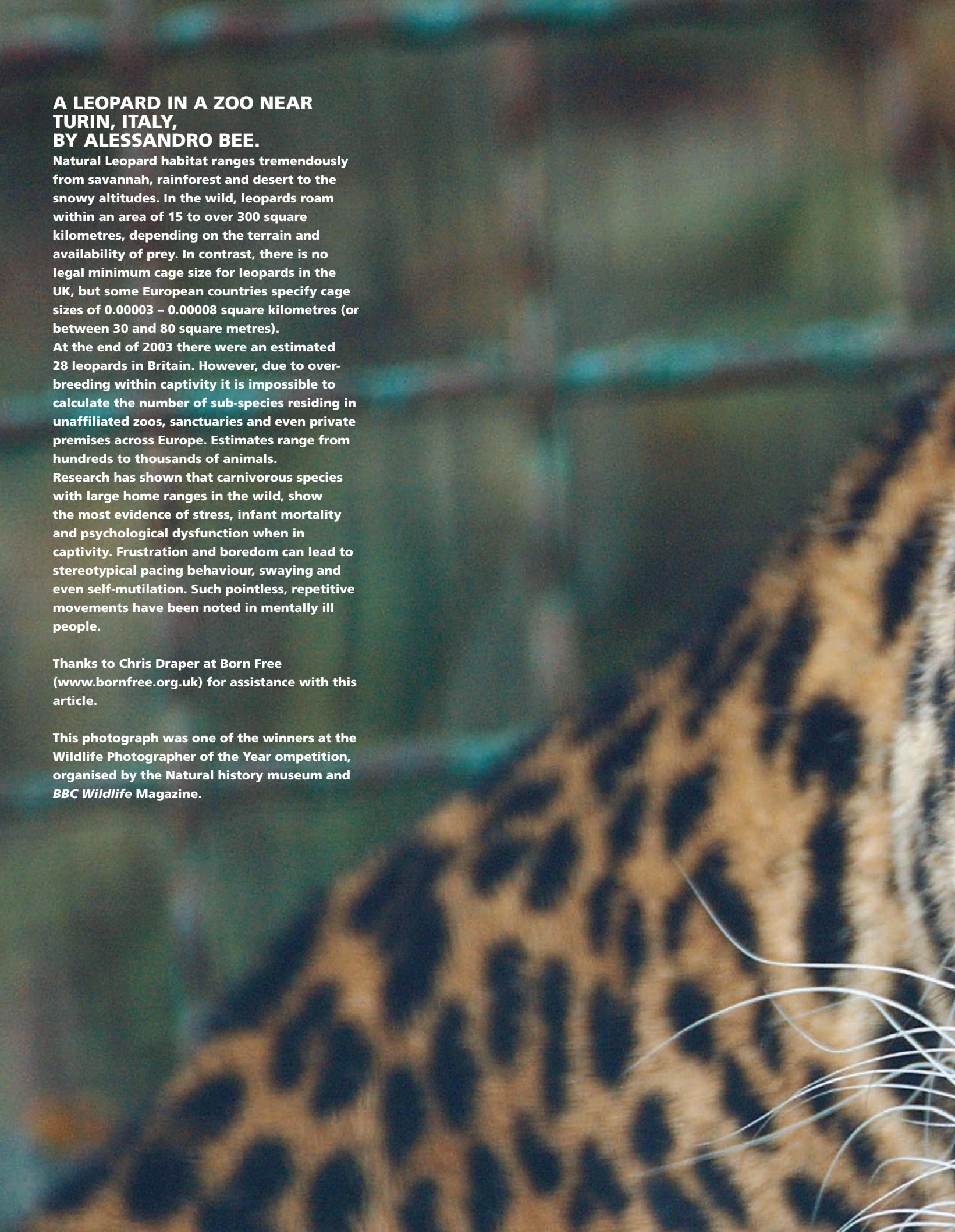
Tel: 0117 914 2424

Grassroots Action on Food and Farming:

Grassroots is a new campaign against corporate control of agriculture. Their aim is to build a network of farmers, environmentalists and ordinary people to help fight increasing corporate power in farming.

<http://www.gaff.org.uk>

01865 791 391



**A LEOPARD IN A ZOO NEAR
TURIN, ITALY,
BY ALESSANDRO BEE.**

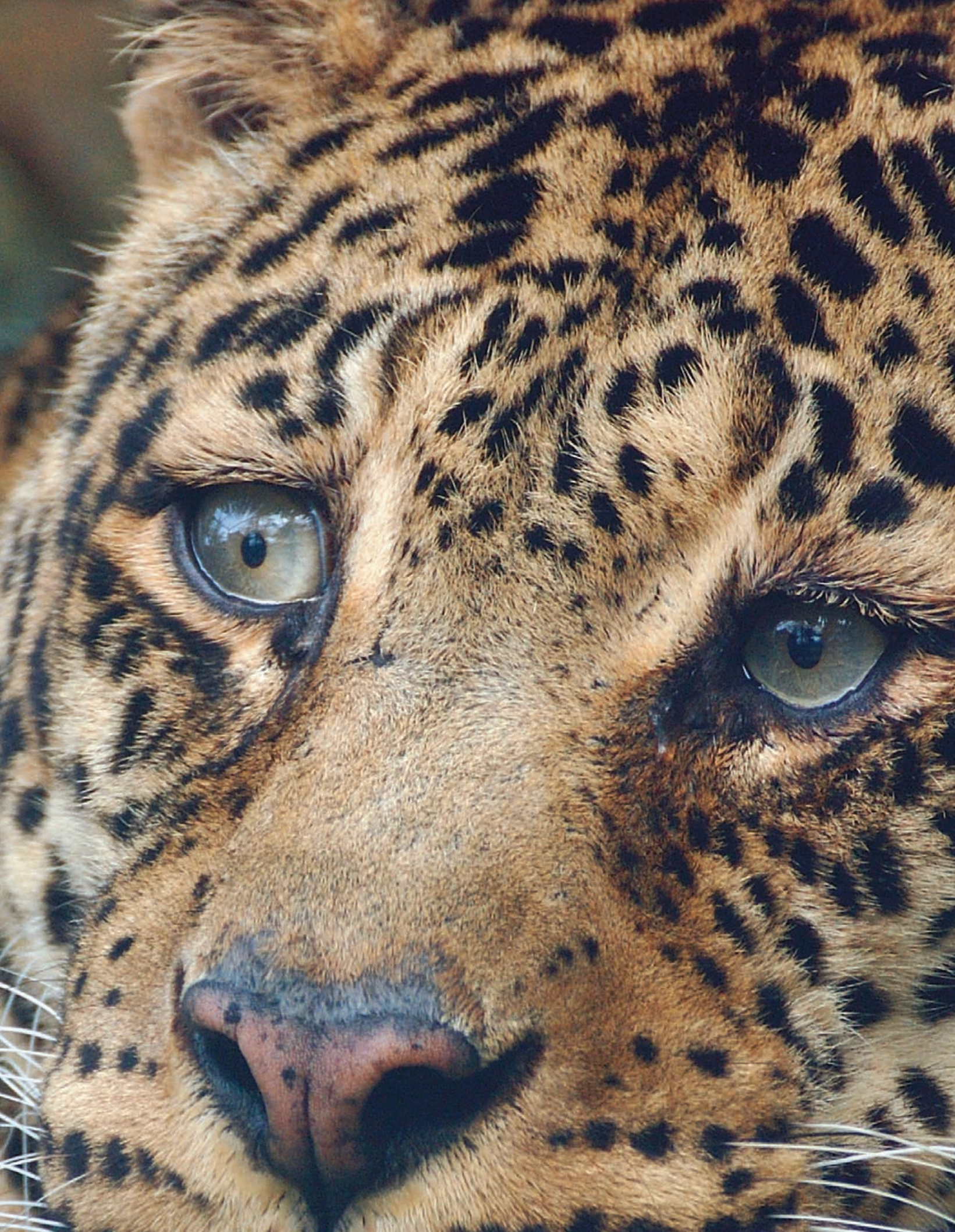
Natural Leopard habitat ranges tremendously from savannah, rainforest and desert to the snowy altitudes. In the wild, leopards roam within an area of 15 to over 300 square kilometres, depending on the terrain and availability of prey. In contrast, there is no legal minimum cage size for leopards in the UK, but some European countries specify cage sizes of 0.00003 – 0.00008 square kilometres (or between 30 and 80 square metres).

At the end of 2003 there were an estimated 28 leopards in Britain. However, due to over-breeding within captivity it is impossible to calculate the number of sub-species residing in unaffiliated zoos, sanctuaries and even private premises across Europe. Estimates range from hundreds to thousands of animals.

Research has shown that carnivorous species with large home ranges in the wild, show the most evidence of stress, infant mortality and psychological dysfunction when in captivity. Frustration and boredom can lead to stereotypical pacing behaviour, swaying and even self-mutilation. Such pointless, repetitive movements have been noted in mentally ill people.

Thanks to Chris Draper at Born Free (www.bornfree.org.uk) for assistance with this article.

This photograph was one of the winners at the Wildlife Photographer of the Year ompetition, organised by the Natural history museum and *BBC Wildlife Magazine*.





MEDICATION NATION

Too fat, too thin, too sad, too happy... Whatever the problem Biotech is developing a vaccine or a pill to cure us. **Mark White** examines the consequences of a world where all our worries can be medicated away.





It may be known as ‘retail therapy’, but the next edition of the *American Psychiatric Association* will recognise being a shopaholic as a clinical disorder. At Stanford University, trials held on the SSRI anti-depressant Citalopram concluded that the drug was a ‘safe and effective treatment for Compulsive Shopping Disorder’.

The rise of compulsive spending mirrors the obesity time bomb slowly detonating in the richest countries of the world, according to psychologists. A recent study found that women in their twenties had gained an average of five kilograms in the last seven years.

In the last six months clinics to treat internet addiction have opened in the US and China. Meanwhile, a Scottish teenager was treated recently by an alcohol trust for addiction to electronic messaging. He spent £4,500 on texting in a year, and quit his job after he was found to have sent 8,000 emails in one month. That’s 400 a day, or about one a minute, every minute of the working day. ‘It’s kind of comforting when you get [a message],’ he told the BBC. ‘I like it, it’s like a game of ping-pong, as you send one and get one back.’

So many new addictions, but the old ones remain. The hardcore smokers can’t ditch their coffin nails. Alcoholics young and old litter streets and hospitals, and there’s scarcely a pub toilet left in the land without a residue of cocaine smeared across the nearest flat surface. It’s enough to make you stay in bed and stare at the ceiling, mind racing about climate change, that lifestyle you can’t quite afford, and the next big terrorist attack.

Mind racing... a Buddhist would tell

you how to cure that by meditating on the impermanence of existence – and that the racing mind is the result of man’s failure to achieve Enlightenment. But Big Pharma has a better idea: in the first week of May a \$60 million advertising campaign began in the States for Lunesta, an insomnia drug to cure... a racing mind. All you need is a prescription and a glass of water.

Swiss biotech company Cytos has 25 research programs underway, including its Immunodrug™ nicotine vaccine CYT002-NicQb, along with vaccines for chronic diseases including obesity, hypertension, allergy, psoriasis and rheumatoid arthritis. The company was granted a US patent in early 2005 for vaccines against different drugs of abuse, and hopes to release its nicotine vaccine in 2010. The vaccine antibodies prevent dopamine, the chemical that leads to a feeling of pleasure, from flooding the brain. They have a half-life of 50 to 100 days, meaning the response could be a boosted by a further injection. The rewards are huge: Decision Resources estimated the ‘stop smoking’ market in America alone will be \$1.5bn by 2007, and as China and India become richer, with more people smoking, eventually more people will want to stop smoking too.

Cytos’ obesity vaccine works on a similar principle with an antibody against ghrelin, a small protein that regulates appetite. If you inject extra ghrelin into people it makes them hungrier. Fat people who lose weight develop extra ghrelin, leading to yo-yo dieting. The theory is that by stopping the uptake of ghrelin it will be easier to stick to a diet. Cytos is

reported to be running trials with 112 obese volunteers on a six month treatment of the vaccine or a placebo, and at the same time

counselling them about healthy eating and encouraging exercise. While obesity is a leading cause of preventable death in rich countries, it is also, in every sense, a growing problem, with rich nations becoming fatter and fatter, and less and less happy about it. A successful vaccine would be worth billions.

The military are in on the act, naturally, sponsoring research into drugs that will keep their soldiers awake without the jittery, glittery rush of adrenaline that follows amphetamine use. And then there are mood-enhancing drugs to combat the rise of depression, a disorder that the World Health Organisation estimates will be the biggest health problem in the industrialised world by 2020.

‘Tomorrow’s biotechnology offers us the chance to enrich our emotional, intellectual and, yes, spiritual capacities,’ says David Pearce, a leading transhumanist philosopher (transhumanists favour using science and technology to overcome human limitations). ‘I think there’s an overriding moral urgency to eradicating suffering. This ethical goal eclipses everything else.’

Zack Lynch, a leading expert on the biotech industry and publisher of several blogs and neurotechnological market reports, dismisses concerns about side effects: ‘Future neurotechnologies will have the capacity to extend all aspects of what makes us human, from self-centredness to radical empathy.’ Eradicate suffering? Making people less self-centred?

Radical empathy? Sounds great. So why does the idea of pills that will eradicate angst give so many people, well, angst?

If people were satisfied they wouldn't need to try to improve themselves. But our societies are based on the concept of endless growth, so they rely on us never being satisfied. Alexis de Tocqueville made this observation in his 1848 classic *Democracy in America*. 'In America I saw the freest and most enlightened men, placed in circumstances the happiest to be found in the world; yet it seemed to me as if a cloud habitually hung on their brow, and I thought them serious and almost sad even in their pleasures.' Maybe it's the price you pay for living in a society based round not happiness *per se*, but its pursuit.

The notion of 'progress' has brought a million fresh hells trailing in its wake.

As Lynch notes in an entry on his *Corante* blog from December

19, 2003: 'Our extensive global connectedness

has created new problems for modern humans.

While many people question the uneven distribution of power that exists in today's world, others are disillusioned by the happiness that wealth was supposed to bring. In every culture, feelings of uncertainty, depression, anger and resentment have surfaced on a vast scale.'

For Lynch the solution is an extension of modernity, or our systems of control over the physical environment, inwards to our mental environment: 'We now need

new tools to address the mental stress that arises from living in a highly connected urbanised world... new tools [that] represent our best hope in a world seemingly out of control.' Those tools are new drugs that, for

him, are a means towards sharing our emotions to create a more empathetic society.

There is an alternative view, explored by philosopher Carl Elliott in his essay *Pursued by happiness and beaten senseless: Prozac and the American Dream*, that looks at alienation in societies – the 'mismatch between the way you are living a life and the structure of meaning that tells you how to live a life... it makes some sense (though one could contest this) to say that sometimes a person should be alienated – that given certain

circumstances, alienation is the proper response. Some

external circumstances call for alienation.'

He gives the example of Sisyphus pushing the boulder up the mountain.

He may be happier on Prozac and his psychic well-being would be improved. But his predicament is not just a matter of the wellbeing of his mental health, but how he is living his life.

If someone's life is making them sick, then you can make them well by either changing how they live their life or by making them fit in with what made them sick in the first place. It is, of course, a lot easier to give someone a pill and hope they'll adapt to their circumstances, just like housewives in the 1950s popped a valium, cleaned the house, cooked dinner, and waited for their husband to come home from a hard day at the office.

Better than well

Not that the meticulous unravelling of human biology stops there. The real kicker is the class of experimental drugs

developed by Cortex Pharmaceuticals, known as ampakines, that boost the levels of glutamate in the brain – a neurotransmitter implicated in the consolidation of memory. The drug's obvious therapeutic use is to treat people with Alzheimer's or dementia, but why stop there? A report in *New Scientist* earlier this

year described the effects of the Cortex Pharmaceuticals ampakine CX717 on 16 healthy male volunteers at the University of Surrey who were kept awake all night and then put through tests. Even the smallest doses of the drug improved their performance, and the more they took the more

alert they became and the better their cognitive performance. The ampakine users remained alert and with none of the jitters associated with caffeine or amphetamines.

Psychologist Peter Kramer was one of the first professionals to discuss the implications of drugs that could 'change' personalities in his 1993 book *Listening to Prozac*. He became interested after prescribing Prozac to patients and seeing radical shifts in how they interacted with the world. Some said they had become the person they always wanted to be. Others felt that Prozac had robbed them a deeply valued sense of self. If the drug could cause such a shift in identity to people who needed therapy, said Kramer, what could it do as an enhancement tool to people who were basically fine? Could it make them 'better than well'?

This notion of being better than well causes unease in western societies, particularly ones with Protestant roots where the notion of getting something for nothing is thought to be a sin. It's being called 'cosmetic neurology', a phrase coined by Dr Anjan Chatterjee, from the University of Pennsylvania, in a paper for the September 2004 issue of *Neurology*. He argues from the slippery slope, saying that: yes, we are getting a boost without doing the work, but we already live in homes with central heating; yes, such drugs could change people's personalities, but steroids and mind-altering drugs do

Eradicate suffering? Making people less self-centred? Radical empathy? Sounds great. So why does the idea of pills that will eradicate angst give so many people, well, angst?



that already; yes, the rich will have better access to such drugs than the poor, but we already accept huge inequalities in society; and yes, government, religions and journalists will urge restraint, but they are likely to be overwhelmed by a 'relatively unrestrained market' and the military.

Patients, he says, will demand the right of access to a drug designed to raise their baseline level of happiness. 'If social pressures encourage wide use of medications to improve quality of life, then pharmaceutical companies stand to make substantial profits and they are likely to encourage such pressures,' he says, '... it does not take much imagination to see how advertisements for better brains would affect an insecure public. Ginkgo Biloba, despite its minimal affects on cognition, is a billion dollar industry.'

There's certainly money to be made, as the following comments on neuroinvest.com about Cortex's CX717 show: 'Given that schizophrenia is the most clinically advanced program, we believe that this particular indication would be the most valuable in a licensing deal... Cortex plus Organon's schizophrenia rights (throwing in depression as a sweetener) would look great in a Big Pharma's Christmas stocking.'

David Pearce poses a thorny question by email: 'Should people be compelled to stay the way they are? After all, the reason we're so discontented a lot of the time is because of the legacy of our evolutionary past – making their vehicles discontented helped out genes to leave more copies of themselves in the ancestral environment. Potentially, the new drug therapies and genetic interventions will be 'empowering' in the best sense of the term. A lot of people today just feel imprisoned in brains, bodies and personalities they didn't choose and aren't happy with it all...'

This brings two competing notions of happiness to a head: the Eastern, which comes

from accepting each moment as being neither good nor bad, but just as something that is, and the Western one, the pinnacle of consumerism and materialism, that of having your desires satisfied. I asked Pearce if he thought it was good for people to have their needs met at all times, and he replied that if those needs don't adversely affect the wellbeing of others, then yes.

The comment reminded me of a quote in Elliott's essay from Walker Percy's *Signposts in a Strange Land*. Writing of a Geriatrics Rehabilitation Unit where old folks grow inexplicably sad despite having all their needs met, he says: 'Though they may live in the pleasantest Senior Settlements where their every need is filled, every recreation provided, every sort of hobby encouraged, nevertheless many grow despondent in their

happiness, sit slack and empty-eyed at shuffleboard and ceramic oven. Fishing poles fall from tanned and healthy hands. Golf clubs rust. *Reader's Digests* go unread. Many old folk pine away and even die from unknown causes like a voodoo curse.'

All technologies have mission creep and unintended consequences. Chatterjee dismisses concern about drug safety with the blithe phrase 'in general, newer medications will continue to be safer', despite little evidence to that end – and recent evidence with fen-phen, Vioxx and the hiding of negative SSRI drug data by Big Pharma pointing in the other direction. The debate is framed in such a way as to make cosmetic



Maybe depression is the price you pay for living in a society based round not happiness per se, but its pursuit

neurology sound like an extension of evolution, when it's about as natural as a GM tomato containing a fish gene. This kind of technological arrogance is what's dooming the ecosphere, not saving it. 'I'm not prepared to say they can't be a good thing,' wrote Elliott, by email. 'They may well be. But I guess my feeling is that while the benefits are obvious, the possible drawbacks are not, and need to be thought about more carefully. There are also a lot of people out there with a financial interest in hyping the benefits and downplaying the risks.'

Take enhanced memory. Sounds great. We've all seen elderly relatives get lost in a fog of misfiring neurons, and it can be incredibly sad. But whether you believe in an intelligent designer or your starting point as the Big Bang, something has led the human brain to its present state of nature. 'We understand little about the design constraints that were being satisfied in the process of creating a modern human brain,' says Martha Farah, from the Centre for Cognitive Neuroscience at the University of Pennsylvania. 'Therefore we do not know which "limitations" are there for a good reason... normal forgetting rates seem to be optimal for information retrieval. You could, in effect, remember too much: the hair colour of the person who sat in front of you in the cinema, the smell as you passed the bakery on your way to work, what you had for dinner every night of the last year – memory after memory too readily accessible.'

A class of drugs used to treat Parkinson's disease gained the nickname 'the Las Vegas pill' after it was found to turn a small but significant number of its patients into compulsive gamblers – ironically by stimulating the dopamine-producing area of the brain that the addiction drugs are aimed at quietening

down. The Doogie mice are another case in point. These smart rodents were genetically engineered to have enhanced memory and learning skills. They were better at recognising and locating objects and remembering painful experiences – but when pain was induced it lasted longer. They found it hurt to be made smart.

There's a wider point at stake here: if nature is something worthy of respect, then why not human nature? Our belief that we are set apart from the world has led us to treat our environment as a plaything for the fulfillment of our desires, though we forget that the demands of our egos are never-ending and monstrous. Can we

ever be too happy? Too rich? Too thin? Too satisfied?

Zack Lynch believes that humans are social animals wired for social acceptance. 'I see no indication that the majority of individuals will not choose to enhance aspects of themselves to make them more giving, caring and empathetic towards each other and the rest of the biosphere,' he writes, by email, choosing not to highlight the increasingly aggressive, competitive economic and social world that we are building for ourselves and future generations. Millions of people already alter their reality by taking mood-altering drugs like ecstasy, or sink a bottle of wine, or hammer a bong, and there's little evidence of an upsurge in love.

Rats exposed to cocaine will keep on self-administering the drug, to keep the pleasurable chemicals swirling around their brains, no matter what happens. That wiring for social acceptance is being rewired for social status, and you can see



the results just by looking around you. Futurist Ray Kurzweil has named 2045 as the point at which humans reach Singularity, the moment when the barrier between our minds and computers disappears and the non-biological portion of our intelligence predominates.

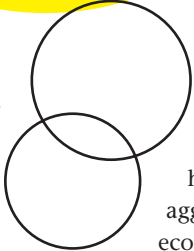
And then? Author Michel Houellebecq, when not scandalising the French establishment, keeps returning to issues of identity and humanity. He did it in *The Elementary Particles*, and in his next book *The Possibility of an Island* he describes a cult that thinks of genetic engineering as a path to immortality. The main character's girlfriend explains: 'What we're trying to create is an artificial humanity, a frivolous one, that will never again be capable of seriousness or humour, that will spend its life in an ever more desperate quest for fun and sex – a generation of absolute kids.'

Pearce believes that drugs that make us happier will rip up most of philosophy: just think, no more Nietzsche or Camus. 'Most of the philosophical tradition is based on grief and suffering. The same is true of traditional "great" literature too,' he wrote. I asked him if he thought art needed suffering to be created, and he wrote back with a link to a book called *Touched with Fire: Manic-Depressive Illness and the Artistic Temperament*. It contains Lord Byron's famous quote: 'We of the craft are all crazy.'

Houellebecq's main character knows where the world is headed: 'Nothing was left now of those literary and artistic works that humanity had been so proud of; the themes that gave rise to them had lost all relevance, their emotional power had evaporated.' So, what an improvement the post-human will be. We will feed our desires and remove all the insecurities and blunt edges and pain and art, and as the sky boils and the ice caps melt and the fish all die and the land is fouled and the bombs keep exploding we will, at least, have a smile on our faces and a happy feeling in our hearts.

■ Mark White is a freelance journalist

If a drug could cause such a shift in identity to people who needed therapy, what could it do to people who were basically fine? Could it make them 'better than well'?





Number of children who die from hunger-related causes worldwide, every three hours: **2,160**

Amount (in tonnes) of food wasted each year in Britain alone: **17 million**

Cost of total food waste in Britain and the US each year (US dollars): **\$134.26 billion**

Amount of money required to halve chronic hunger worldwide over 19 years (US dollars): **\$24 billion**

Estimate of the cost of the Iraq war to the US, per year: **\$108 billion**

Average cost of an Upper crust baguette: **£2.50**

Percentage of people worldwide who earn less than £1.15 a day: **53%**

Number of people starving worldwide: **852 million**

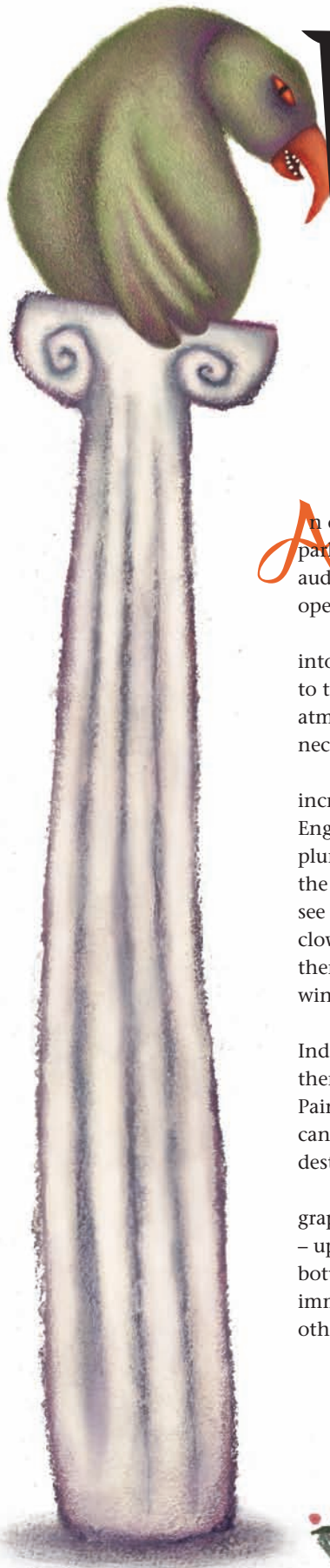
Number of people who are overweight worldwide: **1.2 billion**

AND IF CURRENT TRENDS CONTINUE:

Number of people who will be overweight by 2015: **1.5 billion**

Number of children under five who will continue to die from hunger related causes each year: **6 million**

COMPILED BY **CLAIRE THOMAS**



Nature

Lessons from

BY ANTHONY WALL

Episode 3 - Parakeets

An open-air performance of *La bohème* in a Surrey park. Mimi is dying, her lover is distraught, the audience can hardly breathe for emotion. Puccini's opera reaches its unbearably poignant climax...

Then, without warning, tragedy descends into unscripted farce. A gang of yobs bursts on to the scene – rowdy, irreverent, wrecking the atmosphere. No, not teenagers – parakeets. Ring-necked parakeets, a huge, boisterous flock of them.

These flashy immigrants, once rare, are increasingly common in parts of South East England. They number tens of thousands. Green plumage, red beak, long tail, strident voice... the birds make an instant impression on all who see and hear them. Many enjoy their acrobatic clowning in town trees and gardens and welcome them as a colourful distraction from dreary grey winters.

But the parakeets are not universally loved. Indeed, some people would happily throttle them. One such is Mark Ebdon, estate manager at Painshill Park, setting of that interrupted opera. He can forgive the birds' bad manners, but not their destructive ways.

'They've been raiding our vineyard for the grapes. Painshill produces award-winning wine – up to 5,000 bottles a year, but this may fall to 500 bottles when the parakeets get busy. They seem immune to scarecrows, things that go bang, and other deterrents.'

At nearby Garsons farm, Bob Thompson

also dreams of wreaking revenge on marauding parakeets that regularly plunder his apple orchards.

'They don't really eat the fruit, just peck it two or three times – enough to make it unsaleable. It's too expensive to cover the trees with nets, and you can't insure against bird damage. Something's got to be done...'

Supremely adaptable, ring-necked (or rose-ringed) parakeets exploit every opportunity – including human help, which has enabled them to spread to 35 countries throughout Europe and the Middle East. Urban and suburban life suits them particularly well; there are thriving settlements in London, Amsterdam, Istanbul, and Cairo.

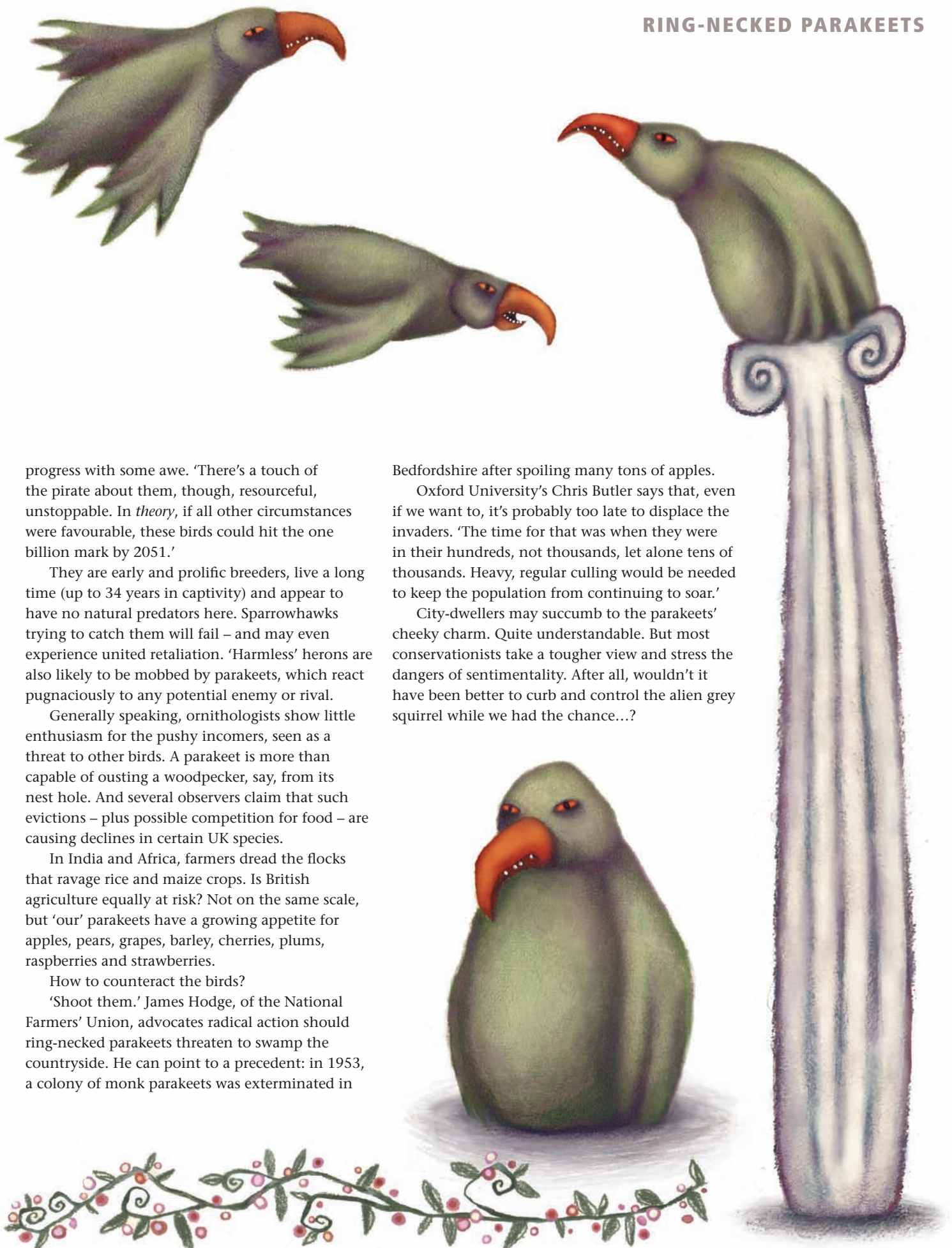
Far from their native haunts (India and central Africa), parakeets made their British debut as long ago as 1855 when a breeding pair was recorded in Norfolk. The birds came and went, an exotic aberration. Or so it seemed until, in the 1970s, ring-necked parakeets staged a startling return. By 2003, the population had topped 10,000. Today, it is rising by 30 per cent a year. Myths abound as to how they arrived and set up home here. Take your pick: they were released by a film company... broke out of airport quarantine... became bedraggled castaways from a capsized ship in the River Thames... the list goes on.

Perhaps, more mundanely, they were escaped pets.

Dr Chris Butler, of Oxford University Zoology Department, has been following the parakeets'



ILLUSTRATION BY LISA EVANS



progress with some awe. 'There's a touch of the pirate about them, though, resourceful, unstoppable. In *theory*, if all other circumstances were favourable, these birds could hit the one billion mark by 2051.'

They are early and prolific breeders, live a long time (up to 34 years in captivity) and appear to have no natural predators here. Sparrowhawks trying to catch them will fail – and may even experience united retaliation. 'Harmless' herons are also likely to be mobbed by parakeets, which react pugnaciously to any potential enemy or rival.

Generally speaking, ornithologists show little enthusiasm for the pushy incomers, seen as a threat to other birds. A parakeet is more than capable of ousting a woodpecker, say, from its nest hole. And several observers claim that such evictions – plus possible competition for food – are causing declines in certain UK species.

In India and Africa, farmers dread the flocks that ravage rice and maize crops. Is British agriculture equally at risk? Not on the same scale, but 'our' parakeets have a growing appetite for apples, pears, grapes, barley, cherries, plums, raspberries and strawberries.

How to counteract the birds?

'Shoot them.' James Hodge, of the National Farmers' Union, advocates radical action should ring-necked parakeets threaten to swamp the countryside. He can point to a precedent: in 1953, a colony of monk parakeets was exterminated in

Bedfordshire after spoiling many tons of apples.

Oxford University's Chris Butler says that, even if we want to, it's probably too late to displace the invaders. 'The time for that was when they were in their hundreds, not thousands, let alone tens of thousands. Heavy, regular culling would be needed to keep the population from continuing to soar.'

City-dwellers may succumb to the parakeets' cheeky charm. Quite understandable. But most conservationists take a tougher view and stress the dangers of sentimentality. After all, wouldn't it have been better to curb and control the alien grey squirrel while we had the chance...?





TIME TO CRY WOLF?

What remains of the once mighty Caledonian Forest is fast being eroded by an ever-increasing population of deer. Without reintroducing their natural predator, the wolf, to the wilds of Scotland, the forest and its ecosystem is in danger of disappearing forever

BY JEREMY SMITH

For most of the earth's history, Scotland was covered in trees – a vast primeval wilderness of birch, rowan, aspen, juniper and Scots pines. On the west coast, oak and birch looked down upon a temperate rainforest of mosses, ferns and lichens. When the Romans arrived two thousand years ago, they called Scotland Caledonia, meaning 'wooded heights'.

Today only one per cent of the once mighty Caledonian Forest – the westernmost stretch of the vast boreal forest that once covered the majority of northern Europe – remains, broken up into 35 isolated fragments. Centuries of deforestation have exacted a heavy price.

About 150 years ago, the forest reached a critical point where the balance of old to new trees became too heavily weighted in favour of the old. Ever since then the forest has grown older and older, shrinking as trees die off and are not replaced by new, younger saplings. And

The biomass of rabbits in Britain exceeds all other wild mammals combined, and rabbits are an introduced species that has only been living in the wild in serious numbers for just over 200 years

despite many efforts at restocking over the years, the young trees have never been allowed to grow to maturity. Their tender young shoots are being eaten away by none other than the iconic red deer.

While the postcard image may be one of a lone creature, the reality is quite different. With no natural predators except for man in the short hunting season, deer populations have grown and grown, and there are now reckoned to be in excess of 600,000 red deer in Scotland. (And of the six types of red deer found in the country, only two are native. The other four are imported species).

Through its eating habits and the damage done as it tramples around in search of food, the red deer is threatening the very existence of both the remaining forest and many rare animals that depend upon it. When the forest was rich in flora, it was rich in wildlife too. Now though, the European beaver, wild boar, lynx, moose, brown bear and wolf are all gone, leaving only a few birds – the capercaillie, crested tit and endemic Scottish crossbill, which occurs nowhere else in the world, clinging on to what is left.

This ecological imbalance is typical of the UK. Over the years we have destroyed most of our native mammal population so that today the only country with less native mammals than us is New Zealand. To put this in perspective, the biomass of rabbits in Britain exceeds all other wild mammals combined, and rabbits themselves are an introduced species that has only been living in the wild in serious numbers for a little over 200 years.

There is one last hope, however, an approach currently reaping great rewards on the other side of the Atlantic. But it is one that the British public may have trouble accepting. To save the woods from the deer we need to reintroduce the wolf.

Seeing the wolf for the trees

In the US public antipathy towards wolves was similar to that in the UK, and by the 1920s they had been eradicated in all states except Alaska, Hawaii and Minnesota. Among the last to go were those in Yellowstone Park, Wyoming. And as with so many of man's actions, the impact of removing the wolves from the ecosystem was unforeseen. With their natural predators out of the way, the deer

multiplied and grazed everything they could get their teeth on. As in Scotland, they ate all the saplings, and the mighty forests of Yellowstone began to die.

Then, in 1990, wolves were reintroduced to the park and for the first time in decades the forest began to grow again. When wolves are present deer do not graze if they cannot see all round, such as river valleys. Here the saplings survive to maturity. Once the trees are back, the other plants and animals that depend on the forest return and the whole ecosystem begins to recover.

While the full impact on Yellowstone will take years to understand, already the signs are promising, often in unexpected ways. Doug Smith, head wolf biologist at Yellowstone, has no doubt as to the extent to which the introduction of wolves has effected the park's ecology. 'In the northern part of Yellowstone, in 1996 there was one colony [of beavers]; now there are over nine,' he explains. 'They came back because the willow has come back in the last 10 years. We think the willow has come back through wolves changing elk behaviour. Because elk now have to worry about wolves, they don't camp out in bottomland willow.

'And because the willow has come back, the beavers have taken advantage. They've made ponds, waterfowl come to those ponds, more willows grow, warblers and flycatchers move in to the willows that the ponds have created and you've got this positive loop of feedback – just because wolves affected elk behaviour which affected willows.' What's more, the beavers' dams slow the water's flow, improving it as a habitat for fish. More wolves mean more trout. The phenomenon is called trophic cascade, whereby one action at one point in an ecosystem results in an unexpected reaction in some other part of an ecosystem.

But what of little red riding hood?

The problem, however, is that that 'action' is the introduction of the wolf. Lions, tigers and crocodiles are all very well on holiday, but we don't want any man-eaters reintroduced into our own country. After all, everyone knows wolves kill people and eat livestock, making them unpopular with farmers, especially the

sheep farmers of the highlands, whose sheep needless to say are second only to deer in their damaging impact on the woodlands. Wolves are also an easy target for the media to whip up a furore should one poor child get killed.

The reality is wolves don't kill many humans. A recent group of 18 international researchers could only find authentic reports of 17 wolf-inflicted fatalities in the last 50 years in all of Europe and Russia and none in North America. Thousands camp each year in US parks such as Yellowstone, and since the wolf's reintroduction, no one has been killed. Yet in the years 1979-1998, 327 people died in the US as a result of dog bites (of course there are many more dogs than wolves and they live in close proximity to humans, but the point is not about numbers so much as about perceptions). To press the point home, in the UK between 20,000 and 42,000 road collisions or near misses are caused each year by deer, and in a recent five-year period, nine people were killed and 10 seriously injured in Scotland alone as a result of such accidents.

Fantastic Mr Wolf

The wolf's supposed aggression, reinforced by so many of our childhood myths, does not bear up to scrutiny. One of the pioneers of wolf biology, Adolph Murie, spent hundreds of hours observing wolf packs on Mt McKinley, Alaska in the 1940s. From his studies he learnt that no more than 20 per cent of their interaction was aggressive, and indeed their relations with one another were much more marked for their friendliness.

Far from being the lone savage hunter, the wolf, *canis lupis*, lives in a remarkably developed social system. The pack is based around family groups of male and female and their cub of the year, plus any offspring who have not yet dispersed. Rarely will outsiders be allowed to join. The parents, being oldest and most experienced, start most activities, from choosing the time and place of hunting to governing who eats most when food it is in short supply. Wolves carefully mark out their territory with urine and faeces, with territories ranging from 100km² to over 2000km² in the Arctic. So strict is the hierarchy in the group that while the



alpha male (and sometimes the alpha female) urinate by cocking their leg, other males stand on all fours, while lower ranking females squat.

Howling is a further part of social bonding, as well as a warning cry to other wolves. There is also evidence of telepathy among packs, with wolves seeming to react to each other even when out of earshot or sight.

Although the group is closely structured, the alphas are not leaders in the human sense. They do not control the pack, but rather are at liberty to choose where to go and how to behave. Because of their perceived status, the rest of the pack is most likely to follow. Nor is their position upheld through force. Wolves have a complicated body language, and it is through posturing, playfighting and growling that superiority is asserted. They are poker players, not boxers. When the time comes for a new alpha male, ranks will shift without bloodshed.

There are three species of wolf, all in decline. The grey wolf is widely spread across the northern hemisphere and numbers around 150,000 worldwide (less than a quarter of the total deer in Scotland). The red wolf lives only in south eastern USA and there are only 250 left. Likewise there are just 500 Abyssinian wolves, found only in Ethiopia, remaining. It is the grey wolf that conservationists are proposing to reintroduce to Scotland.

As with all wolves, adult greys are about the size of a german shepherd dog. Adult males weigh 20-80kg depending on the climate, with females smaller at 15-55kg. In Europe the males tend to weigh about 40kg. They move along steadily at five miles an hour, but can reach speeds of up to 45 miles an hour.

When they eat, they eat voraciously, eating up to 20kg of food at one sitting, but then they can go for weeks without eating at all. And yes, they are meat eaters, so if reintroduced they will kill a few sheep, and there is the tiniest possibility that they might kill an unfortunate human.

The question we have to ask ourselves is, do we want a rich and biodiverse landscape once again in Scotland, and what are we willing to do to get it? Simply planting more trees doesn't work – the

WHAT YOU CAN DO

All these organisations are actively involved in the conservation of wolves, the widening of public awareness and understanding of the reality about wolf behaviour and ecology, and their reintroduction into the wild.

WOLF TRUST

Non-profit organisation educating the public about wolves and advocating a revival of the natural heritage of the Highlands of Scotland through a reintroduction and recovery of wolves. Is seeking funds for the establishment of a wolf centre in Scotland.

WEBSITE: www.wolftrust.org.uk/

WWF-UK CAMPAIGN FOR EUROPE'S CARNIVORES

Aims to raise public awareness, challenge negative perceptions of wild predators and maintain and restore viable populations of large carnivores across Europe.

TEL: 01483 426 444, WEBSITE: www.wwf.org.uk

THE UK WOLF CONSERVATION TRUST

Visits by appointment only, to Berkshire-based reserve which aims to boost interest in wolves, and so enhance their conservation.

TEL: 0118 971 3330, WEBSITE: www.ukwolf.org/

BORN FREE WOLF PROJECT - Runs two current campaigns:

Ethiopian Wolf Conservation Programme

Raising funds for Dr Claudio Sillero-Zubiri of Oxford University as he works to study and protect the most endangered canid in the world in its last strong-hold, the Bale Mountains.

UK Zoo Wolf Survey

Collects information for a vital report on the plight of wolves held in British zoos and circuses.

TEL: 01403 240170, WEBSITE: www.bornfree.org.uk/wolf

CANID SPECIALIST GROUP

The world's chief body of scientific and practical expertise on the status and conservation of all canid species, advising the Species Survival Commission (SSC) of the World Conservation Union (IUCN). You can sign up for their mailing list or look at the newsletter - Canid News.

WEBSITE: www.canids.org/

deer eat them. Culling the deer has been tried and failed. Unless one wipes out the entire deer population, they will always return to eat the trees, which grow far more slowly than the deer can reproduce. Only by reintroducing the missing predator back into the ecosystem can we hope to rebalance it.

Paul van Vlissingen, a landowner in Scotland who is keen to see the wolves reintroduced, sums up the hypocrisy holding us back. 'We worry about whether it's remotely possible that the wolf might kill someone in Britain, but we don't bat an eyelid at the number of people in the Third World who are killed by large mammals. We expect other people to

coexist with large mammals, but we aren't prepared to do so ourselves. It really is rather offensive. We say we don't want wolves in this country because we like our stalking rights and we don't want wolves killing our deer. Well, any country in the world could say that and that would be the end of our global megafauna, As it is, we have very little of it left.'

Or as an old German saying puts it: 'Kein Wolf, Kein Wald' - 'No wolf, no forest'.

■ Special thanks to Ben Panaman, director of the Wolf Trust, for help in the preparation of this article **www.wolftrust.org.uk**.

TINNED SEAL ANYONE?

Do you have images like this? High-quality, shocking and eye-catching pictures that would help raise awareness of the dangers of plastics and rubbish? If so, please email the *Ecologist* art desk at sarah@theecologist.org

PHOTOGRAPH BY STILL PICTURES



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25 FILMS TO WATCH NEXT YEAR

All these films have moved, informed, inspire or enraged us here at *The Ecologist*, and now we have a set of all 25 to give away. All we want to know is what film most made you want to get up off your seat after it had finished and go out and make the world a better place, and why. Email your answer to filmquiz@theecologist.org by February 1, 2006.

1 THE CORPORATION
Winner of 24 International Awards and 10 Audience Awards, this influential critique of modern society examines the impact of corporations on our environment, technology, media, health and our children under the overarching principles of brutal and global capitalism.

2 TEAM AMERICA
In this edgy and astute puppet comedy by the makers of *South Park*, Team America, an international police force dedicated to maintaining global stability, learns that a power hungry dictator Kim Jong Il is selling weapons of mass destruction to terrorists.

3 THE FUTURE OF FOOD
Shot on location in the US, Canada and Mexico, *The Future of Food* explores the political and market forces that dictate what we eat, the rise of genetic modification and the shift in power within the food industry to multinational corporations. It

also advocates that alternatives, including organic and sustainable agriculture, are the only solutions to the crisis.

4 THE END OF SUBURBIA: OIL DEPLETION AND THE COLLAPSE OF THE AMERICAN DREAM This film explores the implications of modern American life, with more and more families moving to the suburbs, leading inefficient and unecological lives.

5 SUPERSIZE ME
To find out 'Why is America so fat?' Morgan Spurlock decides that, for a month, he will eat only food from McDonald's, with a bonus rule – every time the server asks him if he wants to 'supersize', he has to say yes.

6 MCLIBEL
After years of McDonald's suppressing criticism using UK libel laws, *McLibel* is the true story of a postman and a gardener who took the firm its £10 million legal team to court.

7 DROWNED OUT
Drowned out tells the story of a family who stand up against the destruction of their home and culture in the flooding of the Narmada valley. This emotive film follows every-day activists in hunger strikes, court cases, and experiencing police brutality until, finally, the waters rise.

8 BAKED ALASKA
Society in Alaska is divided between Inupiat Eskimos who depend on money from oil,

and the Gwitchin Indians who depend on reindeer that will be threatened with more drilling. In a warming climate houses and roads collapse as the ice melts, and islands are disappearing under rougher seas.

9 BLUE VINYL
Sundance award-winning and Emmy-nominated *Blue Vinyl* was created by Judith Helfand when she found her parents fixing blue vinyl to their house. A determined and incredibly informative film, *Blue Vinyl* is also funny and touching. It makes us question the products we take for granted, and has fuelled the global movement to replace PVC with safer products.

10 STOLEN CHILDHOODS
Stolen Childhoods is a documentary feature film about the growing scourge of child labour, which affects 246 million children worldwide. With incredible footage covering eight countries, this documentary gives children a platform to tell their own stories.

11 LIFE AND DEBT
After three decades of IMF loans, Jamaica's agriculture and industry has disintegrated, undermining local livelihoods. *Life and Debt* is as poignant as it is matter-of-fact, and has great relevance to the legacy of indebtedness the world over.

12 CULTURE JAM
This off-the-wall and hard hitting one-hour film by





director Jill Sharpe tells a story of 'Culture Jammers', whose aim is to retrieve corporate media space, 'reclaiming our mental environment'. These activists, armed with stuffed mice on crosses and DIY anti-stickers aim to subvert the illusion that we have total freedom of thinking and speech.

13 THE FOURTH WORLD WAR With powerful imagery from Mexico, Argentina, Palestine, Korea, South Africa and the war on terror in New York, Afghanistan and Iraq, this inflammatory portrayal 'of war without end and of those who resist' reflects on the consequences of contemporary global capitalism, and will leave the viewer anything but indifferent.

14 THIS IS WHAT DEMOCRACY LOOKS LIKE In this 70-minute documentary, Jill Friedberg and Rick Rowley gather footage from over one hundred amateur operators and activists to plot the story of the November 1999 street protests against the World Trade Organization in Seattle. Narrated by Susan Sarandon and Michael Franti, this documentary exposes a side to the protests largely ignored by mainstream media – the perspective of the protestors themselves.

15 ZAPATISTA This powerful documentary follows the events of the infamous Zapatista uprising after the North American Free Trade Agreement came into effect at midnight on January 1, 1994. Their actions have become legendary and

with narration from Daryl Hannah and comments from Noam Chomsky, this documentary is described as not so much about guerrilla resistance as about the declaration of political and economic independence in Chiapas.

16 TURTLES CAN FLY Written and directed by Bahman Ghobadi and using non-professional actors, *Turtles Can Fly* takes place in the days leading up to America's second war against Iraq in a small village and refugee camp on the border of Iraq and Turkey. In harsh and despairing conditions, Ghobadi portrays his moving story with humour and insight.

17 AFFLUENZA By using personal stories, commentary and old film clips, *Affluenza* comments on the social disease of consumerism, commercialism and unbridled materialism impacting society today. It illuminates the catalysts for this transition and the effect this has on the fabric of individuals, communities and the environment.

18 MANUFACTURING CONSENT: NOAM CHOMSKY AND THE MEDIA *Manufacturing Consent* explores the political life and times of Noam Chomsky from a boy during the depression working on a Manhattan newsstand, to a controversial author, linguist and philosopher. Following Chomsky through Canada, Japan and Europe, this activist film encourages us to think again about the systems of

information we take for granted to avoid the 'web of deceit.'

19 THE TAKE In suburban Buenos Aires, thirty unemployed auto-plant workers take action to occupy their abandoned factory and create jobs under the shadow of the collapsed system, as *The Take* examines the wake of Argentina's dramatic economic collapse in 2001. Naomi Klein and Canadian Journalist Avi Lewis present a poignant story of the struggle against injustice.

20 MONDOVINO *Mondovino* critiques the effect of globalization using an unexpected example - the making and consumption of wine. A complex story is woven showing the fall of tradition and the spread of modernity from Bordeaux to New York and Argentina.

21 SCARED SACRED Winner of nine awards, *Scared Sacred* filmmaker Velcrow Ripper traveled to the jungles of Cambodia, war-torn Afghanistan; the wasteland of Bhopal, ground-zero New York, Bosnia; Israel, Palestine and Hiroshima over five years. His intention was to discover if humanity could turn 'scared' into 'sacred'.

22 PEACEABLE KINGDOM *Peaceable Kingdom* explores the life journeys of farm animals and their role within the American consumer chain. Following the transformations of a Montana

cattlemans and a Michigan beef farmer, who, struggling against their communities but haunted by animal slaughter and the ethics of intensive feedlot farming, change their businesses and relationships in order to rectify their actions.

23 SWADES – WE THE PEOPLE Contrasting the highly developed world of a bright young Indian scientist named Mohan working at NASA in Washington, and his home in the rural India, *Swades* is an honest film about the debate of modernisation and the role of culture in the past and present.

24 ARROWS AGAINST THE WIND Filmed secretly, in Irian Jaya, this documentary is the story of two tribes, the Dani and Asmat, and the story of their social, political and environmental downfall after the Indonesian invasion, opening up land for development and banning all international observers. Emotive and moving, this documentary portrays the voices of minorities and comments unflinchingly at the flipside of development.

25 THIRST Where water can be so easily taken for granted in developed nations, each year millions of children die from diseases caused by unsafe water. *Thirst* investigates the contemporary debate of whether water is part of a shared 'commons' and a human right, or a commodity to be bought and sold.

BOOKS

The Next Gulf: London, Washington, and oil conflict in Nigeria

Andy Rowell, James Marriott and Lorne Stockman

Constable and Robinson
£8.99

Faced with dwindling global fuel resources and increasing insecurity in the Persian Gulf, this book examines the shift in emphasis towards Nigeria's oil resources. It poses the question, why in a country with such oil wealth, are so few of the benefits destined for the people who have lived there the longest? A shocking and untold story, *The Next Gulf War* follows the Saro-Wiwa-led peaceful uprising of the Ogoni, and subsequent protests against oil companies that have resulted in killing, torture and rape.

Facing all the environmental costs and few of the economic benefits, human rights are being sacrificed for natural resources. Fears rise for the region as it becomes of 'strategic interest' to the American military and Britain as their allies.

Reviewed by Caroline Vail

Babylon and Beyond: The economics of anti-capitalist, anti-globalist and radical green movements

Derek Wall
Pluto Press 2005

£14.99

Embracing everyone from Marxists to environmentalists to anarchists, anti-capitalism is complicated to say the least, with most people completely unaware of its diversity. This book details the facts behind each radical group under this banner, making it one of the first books with such a clear and comprehensive coverage that also focuses on the important issue of where the movement is divided – how will we transform the economy?

While Greens wish to slow or halt economic growth, many modern Marxists believe welcoming capitalism will eventually spawn change. Wall brings together the strands of this complex debate, so that the book faithfully lives up to its claims to be 'ideal for activists, and anyone who is trying to find a useful way forward'.

Reviewed by Claire Thomas

Organic Futures – The case for organic farming

Adrian Myers
Green Books 2005
£12.95

Can we change the way we grow our food for good? Myers argues that we can, and puts forward a thoroughly convincing argument for the widespread switch to organic farming. 'Only sustainable forms of farming and agriculture will survive', claims Myers, providing a body of evidence to support his theory, starting from scratch with the basics about soil. He then sets out to pitch different farming methods against each other, using the past as a testimony to how much richer and more productive our soils were before being tainted with pesticides.

He ends the book with his vision of an organic future, and a report on what progress is being made around the world: 'It is only when we can no longer tell where we end and nature begins, that we will truly change the way we grow our food.'

Reviewed by Claire Thomas

State of the World 2005 – redefining global security

Edited by the World Watch institute
Norton 2005
\$18.95

Each year the Worldwatch Institute brings out its latest *State of the World*, and each year it cuts through the partisan nature of so much journalism, presenting instead a balanced view of what really is the state of our planet. What makes it all the more depressing is the fact that in so many ways the findings are as bleak as those that are normally dismissed as

the rantings of doomongers. Poverty, ecosystem collapse, the spread of disease – as this vital volume makes eminently clear, forget the chimera of Al Qaeda, these issues are what we really have to tackle if we want to continue living in a secure world.

Reviewed by Sebastian Boscher

Earth Democracy: Justice, sustainability and peace

Vandana Shiva
South End Press 2005
\$15

In *Earth Democracy*, Shiva provides us with yet another commanding book that evaluates the fragile relationships between man and the environment. Beginning with the enclosure of the British commons from the 16th Century onwards, Shiva shows how increasing competition for the privatisation of resources is wearing away cultural diversity and undermining ecological sustainability. The pressure of neoliberalism, globalisation and expanding economic and social inequality threatens life and livelihoods. Shiva makes an urgent plea for change, suggesting that alternative principles of inclusion, non-violence and the reclaiming of the commons can catalyse a democratic and sustainable future.

Reviewed by Caroline Vail



Your **32-page** guide to ethical living

green pages

WINTER IN SEASON...

Celeriac and chilli gratin... Roast goose, roots and apple sauce... Hemp and parsley pesto .. and Blackberry champagne cocktails

SEASONAL PIZZA OF THE MONTH

Kale, garlic, chilli and ham

FERME DE LA SANSONNIERE

Monty Waldin visits one of the world's best biodynamic vineyards



CHOCOHOLISM

THE GOOD, THE BAD, AND THE UGLY SIDE OF OUR CHOCOLATE ADDICTION



**Ever
wondered
what's in
your
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Water borne impurities come in all shapes and sizes, some microscopic, some... well slightly bigger.

No matter what you may find in your tap water, visible or invisible, only one purification system has the capacity to remove 99.99% of impurities to leave you with truly pure water.

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Wine,
page 76



Contents

70 Winter in season

As we head toward the longest night, with the frost thickening on the ground, keep your eyes peeled for hardy snowdrops, the hairy stemmed Daisy and the delicious Oyster mushroom. And for those who enjoy ice skating, keep your fingers crossed for a frozen Thames and a chance to relive the first 'frost fair' of 1608.

72 Winter recipes

Dark by 4 o'clock – thank goodness for Hugh F-W and his oven ready sidekick Gill Meller, you won't be tempted into watching countdown or mind numbing sudoku. Simply head for the storecupboard, and prepare to gorge yourself on: roast winter vegetables; celeriac and chilli gratin; hemp and parsley pesto... whilst drinking Gideon Hitchin's blackberry champagne cocktails.

75 Pizza of the month

...Kale, garlic, chilli and air dried ham or, once you've cracked Gill's easy to follow recipe for the base, why not pile on all the Christmas leftovers, cover in good cheddar and avoid the chorus of 'do we have to eat this'?

76 Vineyard profile - Ferme de la Sansonniere

Monty Waldin, our organic and biodynamic wine maestro, is astonished by the complexity of the Angelis biodynamic vineyard in Anjou. The vines are pruned as bushes not hedges, requiring no wire support, allowing the sap to rise and circulate in the vine more freely. And the result...? magnificent tasting, chemical free white wine.

78 Chocoholism

From rock bottom cocoa prices, and adulterated industry shortcuts to exquisite dark chocolate, Pat Thomas explores the Good, the Bad and the Ugly side of our chocolate addiction.

90 ESSENTIAL DIRECTORY

Over 200 UK based ethical businesses and organisations striving to supply the market with essential products and services that aren't costing us the earth. So, if you really do want to make a difference, don't shop in supermarkets / chain stores... shop here:

- Baby 90**
- Careers & Recruitment 90**
- Drink 90**
- Food 90**
- Fashion 93**
- Funerals 93**
- Gardens 93**
- Health & Beauty 94**
- Holidays 94**
- Home 94**
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- Finance 96**
- Transport 96**
- Recycling 96**
- Storecupboard 97**
- Volunteering 97**

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WINTER IN SEASON

Another month, another chance to discover the UK's finest fresh produce

Eat now

VEGETABLES:

- Artichokes (Jerusalem)
- Brussels Tops
- Brussels Sprouts
- Broccoli (purple sprouting)
- Beetroot
- Celeriac
- Cauliflower
- Chicory
- Chard
- Celery
- Carrots
- Cardoons
- Cabbages
- Endive
- Kohlrabi
- Lamb's Lettuce
- Peppers and Chillies
- Rocket
- Radishes
- Sorrel
- Swede
- Sweetcorn
- Watercress

FRUIT:

- Apples
- Pears
- Quince
- Rhubarb



WINTER FOOD FOR FREE

Dandelion: One of the most common British weeds. The roots of this plant can be chopped and sautéed in vegetable oil and soy sauce. Alternatively the young leaves are ideal in salads, or can be cooked with butter and seasoning.



Watercress: Rich in vitamin C and traditionally found in and near running water, this wild species is ideal as a cooked vegetable with

November's hazelnuts, orange and lemon juice. Avoid the young leaves, and pick the darker tastier ones. Never pick in stagnant or slow moving water, cut from the top of the shoots and wash them well. You can make a good soup with watercress, potatoes and cream.



Oyster Mushroom: these versatile greyish-blue fungi are fan shaped, flat on top with white flesh and a mild flavour that lends itself to rich cooking. They grow on dead or dying beech and ash branches where you should collect the young specimens for tenderness. Cut into small pieces, they can be fried in a batter with lemon juice, grilled, added to stews, or made into a thick soup.



Lamb's Lettuce: A small plant with oblong and slightly toothed leaves, it is usually found growing on arable land around banks and walls.

Common for most of the winter, Lamb's Lettuce is now being more widely cultivated. The leaves make a good supplement to salads, served with a sharp dressing to bring out the best of the flavour.



1608

YEAR WHEN THE FIRST FROST FAIR WAS HELD ON THE FROZEN RIVER THAMES. THERE WERE TENTS, SIDESHOWS, FOOD STALLS AND ICE BOWLING.

Some Picking Rules

- Never strip a plant completely.
- Never take the flowers and seeds of annual plants: they rely on them for survival.
- Don't pull up whole plants.
- Avoid areas that may have been sprayed with insecticides or weed killer, as well as the verges of heavily used roads.

Source: *Food For Free* by Richard Mabey (Collins)



WILDFLOWERS TO LOOK OUT FOR IN WINTER:

Groundsel: This annual hairy weed grows to 40cm tall showing yellow flowers with no outer ray of florets. The flowers form in loose-branched clusters and the plant is found on cultivated as well as arable land, wasteland, gardens and on sand dunes.

Snowdrop: Part of the daffodil family, these grow to 25cm tall from around January, and form nodding white flowers with three outer petals and three shorter green-tipped inner petals. This poisonous perennial is found in woodlands, riverbanks and wasteland, favouring damp areas.

Shepherds purse: Part of the cabbage family, these branched stems grow to 40cm tall and have tiny white flowers up to 8mm across with four petals each. The plant bears heart-shaped fruits on long stalks and the leaves on the base of the plant form a rosette. Found on arable and cultivated land, wasteland, roadsides and some gardens.

Daisy: This perennial herb has hairy, leafless stems that grow to 15cm tall with a yellow central disc of florets and an outer ray of white florets that can be tinged with red underneath. Found in grasslands and meadows and garden lawns.

Source: Wild Flowers: an easy guide by habitat and colour by Tracy Dickinson (Green Earth Books)



WINTER SOLSTICE – 21 DECEMBER SYMBOLS OF LIGHT, GOODWILL AND FERTILITY.

Midwinter's day has been a time of celebration through the ages. Ancient druids saw the winter solstice or Alban Arthuan (light of Arthur) as a pivotal date in the year. The longest night symbolised the death of the sun, and simultaneously the rebirth of light as the point from which the sun would grow stronger. Ceremonies and celebrations would be organized to ensure the safe reincarnation of the sun gods. Stonehenge was a traditional site for such rituals.

Another mystic symbol, Mistletoe represents one of the most sacred plants in European folklore as it was considered to bestow life and fertility. Though commonly found growing on apple trees, the rarer Oak Mistletoe was venerated by Celts, Greeks, Romans and Druids, as the Oak tree was a revered symbol of strength and knowledge. It was believed that whatever grew on the Oak was derived from heaven and that Mistletoe in winter retained the life and soul of the Oak after it had lost its leaves. When hung on the doors of houses it would ward off evil spirits and offer goodwill to visitors. Traditionally it was collected with great care and ceremony, as mistletoe dropped in collection would bring great misfortune.

In Scandinavia a Yule log would traditionally be brought to the home, Yule meaning 'turn' representing the turning of the sun in the sky. The log would be lit whilst drinking mead and watching the flames make the light which was now disappearing for winter. Evergreen foliage such as Holly and Ivy are important seasonal symbols for bringing colour and life back into the home. In the villages the young would dance dressed in these leaves, the Holly representing male and Ivy the female to bring fertility in the New Year.

BY CAROLINE VAIL

SEASONAL RECIPES FOR WINTER

If the thought of turkey fills you with dread, try Hugh Fearnley Whittingstall's delicious roast goose recipe instead. Whatever you eat, wash it down with a Blackberry cocktail.



In December British cooks can get a bit seasonally jingoistic (or perhaps that should be jingleistic), as if the festivities at the end of the month were all that mattered. For weeks beforehand (when is Stir Up Sunday, I can never remember), they begin stockpiling seasonal goodies in the larder, to unleash them all in one explosive 48-hour binge.

So, before I cut loose and get all festive myself, I want to emphasise a very important point. These recipes, like cute puppies, are not just for Christmas. They are for life during all the colder months. The way I see it, if there is only one day of the year on which a dish gets an outing, it's either because you don't like it or because you are unable to break free from the stifling bonds of tradition.

If the former, then why not simply drop it altogether? (Try my chestnut and chocolate truffle cake instead – everybody likes that.) If the latter, then GET A GRIP! Who's in charge here?

Whether you're religious or not, the Christmas meal is something pretty sacred. It is a time when we are looking to feed our better selves. The food we choose to eat needs to spread love, warmth, goodwill, forgiveness and optimism around a large table of people who, though bonded together by varying levels of shared genes and shared history, might not otherwise choose to sit down and eat together. It needs

to weave a spell of magic that suspends any disbelief in the meaning of family and indeed in the meaning of Christmas. And although normal, sceptical service is likely to resume with the Boxing Day hangover, something of the spirit of that meal should linger deep in the unconscious, helping to keep us sane and sanguine for the next 12 months.

This is a tall order, and the mild, white flesh of turkey, even at its best, simply isn't up to the job. What's required is something heartier, richer and more intense. What's needed is a flesh whose savour runs deep. I said 'sanguine', and on Christmas Day I want to taste blood. Roast goose, served perfectly pink, is one superb answer to the challenge.

ROAST GOOSE WITH ROAST ROOTS, APPLE SAUCE AND GRAVY

Prick the surface of the breast all over with a sharp fork and rub well with a little rough salt and pepper. It can be served ever so slightly pink, which is best achieved by roasting fast in a hot oven (220°C/Gas Mark 7) for about 50 minutes. Let it rest for 20 minutes before carving.

Here's how to fix the accompaniments:

The gravy

The basis for your gravy is the stock in which the giblets, neck (and maybe the feet and head) of the goose were cooked. After the initial cooking, this stock should be strained and refrigerated, so the fat, which will set on the top, can then easily be removed. Then warm up the stock and strain it through a cloth or muslin into a clean, heavy-based pan. Add one third as much red wine as there is stock and bring to the boil to reduce. The stronger the reduction, the less you need. I like to think in terms of about a tablespoon per person, and so I reduce it until I have about 200ml. Do not season with salt or pepper until after the reduction is finished or it will become unpalatably salty as it reduces.

This will make an intensely flavoured, but quite thin jus to serve with the goose. If you like a thicker gravy, whisk a little *beurre manié* (soft butter mixed to a paste with a little plain flour) into the boiling juices until you get the

thickness you require.

Both versions can be supplemented at the last moment by the juices strained from the roasting tin, deglazed with another splash of red wine. But skim off as much fat as you can and whisk the gravy well to incorporate the little that inevitably gets through.

The apple sauce

Peel, core and slice 3 large Bramleys and cook them with just a tablespoon of water, a small knob of butter and 1 tablespoon caster sugar until they disintegrate. Keep simmering gently for 10 minutes or so until you have a nice, thick apple purée. Sweeten to taste with a little more caster sugar if you like (I recommend you keep it tart to cut the fat of the goose).

ROAST WINTER VEGETABLES (INCLUDING CELERIAC)

While this is an essential and luxurious accompaniment to the roast goose, it also constitutes a wonderful dish in its own right. Goose fat, if carefully used, can be recycled several times, and a dish of vegetables roasted in goose fat is easily delicious enough to get a solo outing as a supper dish once in a while.

Any of the following vegetables can be roasted in about 2cm depth of rendered goose fat. Truth be told, good-quality lard (home-rendered), beef dripping or best olive oil can also be used to delicious effect. The fat or oil should be thoroughly heated in a roasting tin in a fairly hot oven (200°C/Gas Mark 6) before any of the vegetables go in. They do not all take the same time to cook, so can be added at staggered intervals. All should be turned once or twice during cooking and seasoned towards the end with salt and pepper.

To serve up, drain the roasted vegetables on kitchen paper, pile them in a hot dish, give a generous final seasoning of salt and pepper, and take to the table.

Basic preparation and cooking times are given below:

- Potatoes** – peeled, par-boiled for five minutes in well-salted water, cut as you like, and scratched with a fork: 40–45 minutes.
- Parsnips** – peeled and cut as you like: 30–35 minutes.
- Celeriac** – peeled and cut into 5cm cubes: 30–35 minutes.
- Jerusalem artichokes** – scrubbed and dried, but unpeeled and left whole: 30–35 minutes.
- Swede** – peeled and cut into large chunks: 30–35 minutes.
- Beetroot** – raw, peeled and cut into large chunks: 30–35 minutes.
- Pumpkins and squashes** – in chunky pieces, seeds removed but skins still attached: 30 minutes.
- Carrots** – big donkey carrots, peeled and cut into large chunks: 30 minutes.
- Shallots (or baby onions)** – whole and in their skins: 30 minutes.
- Garlic** – whole bulbs in their skins: 30 minutes.
- Leeks** – cut into 5cm lengths: 20 minutes.

CELERIAC AND CHILLI GRATIN

(serves six)

This dish surprises and delights everyone who tastes it for the first time. I have taken to serving it as a course on its own, though it goes very nicely with lamb – either grilled chops or roast leg. Exactly the same procedure can be followed using sweet potatoes, or a mixture of sweet potatoes and ordinary potatoes.

Ingredients:

1kg celeriac, 3 tablespoons olive oil, 3 garlic cloves, finely chopped, 1/2–1 fresh red chilli (depending on strength), finely chopped (or 1 teaspoon dried chilli flakes – *not* powder, 250ml single cream, salt and freshly ground black pepper

How to make: Peel the celeriac and slice as thinly as possible – about the thickness of a 10 pence piece is ideal; use the slicing blade of a food processor, if you like. In a large mixing bowl, toss the celeriac slices with two tablespoons of the oil and all the other ingredients until the slices are evenly coated and the garlic and chilli are well distributed. Transfer to a lightly oiled gratin dish, spreading out the slices with your fingertips: you do not have to layer the gratin piece by piece but try to ensure that the slices are mostly lying flat. Pour over any cream left in the bowl and trickle the remaining oil over the top. Bake in a fairly hot oven (190°C/Gas Mark 5), for 40–50 minutes, until the celeriac is completely tender and the top is browned and crisp. For extra crispness, you could finish it under the grill for one to two minutes.



GIDEON HITCHIN'S BLACKBERRY CHAMPAGNE COCKTAILS

This is a great New Year's Eve drink, using up those blackberries in the freezer from the autumn.

Each glass:

Put a few frozen blackberries into a glass. Add a good shot of crème de mures (sauvage, if possible). Top up with very cold champagne. Get ready to do something you'll probably regret.

CRAZY JACK
ORGANIC

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- ★ Reduce the use of pesticides, and
- ★ Encourage biodiversity



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**Roast goose with
roast roots, apple
sauce and gravy**

CELERIAC SOUP WITH HEMP AND PARSLEY PESTO

Celeriac to me is 'The winter vegetable'. It's as reliable as it is delicious.

It pairs so unbelievably well with so many things.

Throughout the colder months, celeriac has an almost constant presence in my kitchen and on my menus. There are lots of recipes available in which celeriac is used – in fact it's as versatile as the potato.

Ingredients:

50 g butter
1 large celeriac – peeled
350g washed leeks – sliced
100g potato – peeled
2 cloves of garlic – chopped
1 medium onion – chopped
750ml of good chicken or vegetable stock
100ml double cream
Salt and pepper

How to make:

In a large, heavy-based pan sweat the vegetables in the butter until soft. Now add the stock, bring the soup to the boil, turn down the heat and simmer for 20 – 30 minutes. Liquidise the soup until smooth and creamy. Return the soup to the pan and place back over a medium heat. Season well and stir in the cream. The soup is ready to eat. Garnish with confit chilli or stir in a spoon of my Hemp and parsley pesto.

HEMP AND PARSLEY PESTO (for six)

2 large bunches of organic flat leaf parsley. Washed and leaves picked from the stalk.
2 peeled garlic cloves
20g hemp seeds
2 good pinches of Maldon salt
1 pinch ground black pepper
75g hard goats cheese. Finely grated.
150 ml hemp oil
The juice of half a lemon

How to make:

Put the parsley in the bowl of a food processor with the garlic and salt. Pulse until the parsley is fairly fine. In a small frying pan toast the hemp seeds for a few minutes until their nutty aroma is released. Pound the seeds in a mortar to a fine texture. Add the pounded toasted hemp seeds to the parsley along with the grated goats cheese and the juice of half a lemon. Process for a minute and then gradually start adding the hemp oil. When everything is combined and the pesto has reached the desired texture, check the seasoning and serve over hot pasta or spoon into glass jars topped with a film of hemp oil, seal and refrigerate for up to two weeks.

PIZZA OF THE MONTH

Seasonal

Forget 'Four seasons', at this time of year the topping you want on your pizza is Kale.

PIZZA BASE

(makes enough dough to serve six)

Ingredients: 500 grams of flour; 300 millilitres of water at body temperature; 10 grams of fresh yeast or 5 grams of dried yeast; 10 grams of salt; two tablespoons of olive oil.

How to make: Find the right bowl to make your dough in. It needs to be big enough to incorporate all the ingredients (once found, it will always be useful). Combine the yeast with the warm water in the bowl, let the yeast dissolve. To this add 50 grams of plain flour. Set the bowl aside in a warm place. After 20 to 30 minutes the yeast should have formed a sponge.

Add the flour, salt and olive oil to the bowl.

You can now place the mixture in the bowl of a food processor fitted with a dough hook. Alternatively roll up your sleeves and knead it by hand for 10 to 15 minutes on a lightly floured work surface.

Lightly grease the bowl with olive oil and return the dough to it. Cover with a damp tea towel and allow the dough to rise for two hours. Knock the dough back and allow it to rise for a further 30 minutes.

Divide the dough into two, three or four individual balls depending on how many pizzas you wish to make.

Roll each ball out on a floured work surface to a thickness of three or four millimetres. Transfer to a baking tray and top as desired.

Find out more

For further information on the 'Build and Bake' course, please go to www.rivercottage.net and select River Cottage Events.



THIS MONTH'S TOPPING

KALE, GARLIC, CHILLI AND AIR DRIED HAM

In the festive month of December, making pizza might be the last thing on your mind.

But don't let all that turkey get to you, a good pizza is a wonderful thing. If you get the chance try putting this one together.

Follow the instructions for making and proving your dough for the base.

FOR THE TOPPING:

Ingredients:

1 tin chopped organic tomatoes
A pinch of sugar
A pinch of salt
100mls water
Kale – roughly chopped
2 cloves garlic
2 dried chillies
1 mozzarella
Extra virgin olive oil
A few slices of air-dried ham
Chilli oil

How to make:

Make a simple tomato sauce by cooking down one tin of chopped organic tomatoes, with a pinch of sugar, a pinch of salt and 100 mls of water. Simmer over a medium heat until the tomatoes are broken down and thickish. This will take about half an hour.

Wash and destalk the kale. Chop it roughly and throw it into a pan set over a high heat with a few slugs of olive oil, 2 peeled, sliced garlic cloves and 2 dried chillies, deseeded and chopped. Sweat the kale down. Keep it moving around the pan, the kale has to be well wilted and all the water to have evaporated. Season the kale with salt and pepper and set aside.

Roll out the dough, spoon on the tomato sauce using the back of a spoon to spread it out over the dough. I like to bring the sauce right to the edges. Break over half the mozzarella and distribute it as evenly as possible. Now tear over the braised kale, it might need separating and carefully laying out. Tear over the remaining mozzarella. Season the pizza with a little salt and pepper and extra virgin olive oil.

Cook on the bottom shelf of a hot, hot oven until the cheese is melted and the base is crisp and browned.

When you serve the pizza, lay over a few thin slices of air-dried ham, and a little chilli oil.

Monty Waldin visits La Ferme de la Sansonnière, one of France's, if not the world's, most complex Biodynamic vineyards.

FERME DE LA SANSONNIÈRE



Usually, when wine writers wax lyrical they use the word 'complex' only to describe the myriad flavours emanating from the glass of wine under their often bulbous, red noses. But in La Ferme de la Sansonnière's case, the word complex describes a top-notch wine estate – one that has been picked apart by its enormously creative owners, Marc Angeli and his wife Christine over the last 15 years. They have re-constructed it to become a mixed farm and vineyard that perfectly represents Biodynamism's environmental and qualitative ideals.

In 1990, the Angelis bought the then conventionally farmed La Sansonnière. Marc had studied stonemasonry but always wanted to make wine (sweet white wine in particular), and Sansonnière provided the perfect opportunity, located as it is in Anjou, the Loire sub-region famed for medium-sweet to sweet white wines from the Chenin Blanc grape.

That same year saw their first harvest, and already the Angelis were clear that they were going to do things differently.

According to Marc: 'We were one of only five growers in the Loire not to add sugar to our wine.' This is a legally endorsed practice (called chaptalisation) which boosts wine alcohol and sweetness levels. Chaptalisation is allowed in most French wine regions because industrially farmed vines overdosed on chemical fertilisers cannot fully ripen their grapes before the leaves start falling in autumn, meaning a little help in the form of sugar is needed in the winery. Growers must buy sugar through legally approved wholesalers, but even then they never seem to have enough. As Marc says 'try and buy a bag of sugar from the supermarket during harvest time and you won't be able to.'

At Sansonnière, however, the Angelis eschewed the industrial winemaking route by immediately adopting Biodynamics (the estate is Demeter certified). For example, they have a small herd of cows to produce manure for compost, which then provides slow-release food for the soil in which the vines grow, in contrast to the quick-release chemical fertilisers

that are designed to feed vines direct.

The vine leaves in the Sansonnière vineyard radiate a deep, sea-green – they are rich in vital nutrients like magnesium, iron and boron, in contrast to the more yellowy, excessively nitrogen-rich vines of their neighbours. The Sansonnière vines are strong enough to ripen their grapes without the need for sugar in the winery. 'Our vines ripen days, sometimes weeks earlier than they used to as the effect of Biodynamics takes hold and the vines find their balance,' says Marc.

Another key tool has been the Biodynamic Horn Silica spray. This is made from ground quartz (silica) buried in a cow horn during the summer months, during which time the quartz fills with solar energy (or so the precepts of Biodynamia claim). The quartz is then dug up, diluted and stirred in water for one hour, before being sprayed over the vines at sunrise in spring and autumn.

'It seems incredible to think that using Biodynamic Horn Silica at doses of just five grammes per hectare can have such a

beneficial effect,' says Marc. 'It encourages the vines to grow towards the light which makes ripening the grapes so much easier, and it discourages shade-loving vine fungal diseases, too. I spend four times less money on organic anti-rot and anti-mildew treatments like sulphur dust and Bordeaux Mixture than I would do under a conventional, industrial system.'

There are more differences, such as how the vines are pruned. The Angelis prune into bushes, rather than hedges, so no supporting wires are needed – very unusual this far north. As Marc explains: 'First, the vines should be strong enough to support themselves without wires, and second, bush training means the vines grow lower making it easier for the sap to rise and circulate than for higher trained vines grown with wires and support posts.' A vine without free-flowing sap is like a human with a blood clot, and will soon succumb to illness and disease.

The Sansonnière vineyard covers nearly eight hectares (20 acres). In true stonemason fashion, Marc has chipped away at the vines he and Christine took over, removing those on excessively vigorous hybrid root stocks. These hybrids give the vine scant hope of ripening its grapes before equinox rains. Replacing them with vines on slow growing non-hybridised rootstocks ensures both riper grapes, steadier growing, and ultimately longer-lived vines.

One of the major aims of Biodynamics is to make the farm as self-sufficient as possible, and four hectares of the Angelis 12-hectare estate has been given over to non-wine crops (unlike most French vineyards, which are vine monocultures). Old, unproductive apple trees were grubbed up and replanted for apple juice and cider. Sunflowers were sown for their oil, wheat for flour, and other cereals sown to feed the domain's animals.

These include both the aforementioned cows which, as well as producing manure for compost also provide meat and milk (for cheese), plus two horses that are used for ploughing the vines. There are also bee hives for honey, a small vegetable garden, and a flock of chickens for the family table.

In the winery, Angeli's obsession with making sweet white wines has calmed. Now the majority of his white wines

are bottled dry under the Anjou Blanc denomination and the respective single vineyard names they have, like La Lune (after the crescent-shaped plot the vines come from), Les Fouchardes, Coteau du Houet and Les Vieilles Vignes des Blanderries (the old vine bottling).

Loire whites tend to have a very acidic backbone, partly due to the northerly latitude but also because the local Chenin Blanc grape can be very acid; but the Sansonnière white wines have invitingly softer centres than one would expect. This is because Marc allows a secondary fermentation (the 'malolactic') of the wine acid while the wine is in barrel. This allows harsh, appley tasting (malic) acid to be transformed by natural bacteria into softer, more buttery lactic (or milk) acid.

Later picked, sweet wines under the Bonnezeaux and Coteaux du Layon *appellation contrôlées* (AC) are made in depressingly small quantities, but magnify the Chenin Blanc grape's intrinsic thickness. The Angeli's other wines consist of a luscious dry pink wine sold as a *vin de table* based on Grolleau Gris grapes planted in the mid-1960s and made by leaving the dark grape skins on the clear juice for just one night.

The Angelis bottle their wines with minimal doses of the almost universally used wine preservative sulphur dioxide. This should reduce the hangover effect should you over-imbibe, but it means the wines are more fragile under ageing; so to be guaranteed perfect storage it pays to make an appointment to taste and buy the wines direct.



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Anjou Rouge AC 'Les Gelinettes Jeunes Vignes'

Price £15.50 per bottle

Dry red wine made from youngish Gamay vines (hence 'jeunes vignes') planted since the late 1990s on low yielding rootstocks for small, marble-sized grapes which produce little juice but thick skins for extra-intense flavours.



Bonnezeaux AC 'Coteau de Houet'

Price £39 per bottle

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CHOCOHOLISM

The good, bad, and ugly sides of
chocolate addiction.

By **Pat Thomas**

Eat a bar of chocolate and chances are you will soon be awash with some kind of guilt. If you are health conscious you will be fretting about calories, fat, pimples and pesticides. If you are socially and ecologically aware there will be the added concern about the swathes of irreplaceable tropical forest that were cleared to grow the cocoa beans that went into your favourite sinful treat. You will also worry about whether the cocoa pods were harvested by young children sold into slavery by their impoverished families and often starved and beaten by cruel plantation owners, and whether those fertilisers and biocides used on cocoa plants have harmed its growers and the surrounding environment.

You will also be acutely aware that into even the most ecologically sound lives a little paradox must fall. You may be committed to eating locally grown food, but there are nevertheless a few commodities that most of us now use daily – coffee, tea, spices and of course chocolate – that are only grown in a few specific, even remote parts of the world. Most of us could do without these items, but the reality is that few are prepared to. So, for the 5-10 per cent of your diet that isn't of local origin, it's important to make choices that make some positive contribution to health and the environment.

If you are prepared to look, there are one or two silver linings behind these dark clouds of chocolate guilt. By making considered choices about the kind of chocolate you are prepared to eat – for instance buying only organic and Fair Trade chocolate – you can make a significant contribution to more humane and ecologically friendly practices on cocoa plantations (see box), and actually improve the lives of those people who rely on cocoa for their livelihood.

In addition, good quality chocolate has some health benefits too. In 2000 the *Journal of Nutrition*, the official journal of the American Society for Nutritional Sciences, published a major article on the historical medicinal uses of chocolate. Apart from a fascinating history of cacao, it listed two and a half referenced pages of health claims for chocolate, including improving cardiovascular

health, increasing breast milk supply, nourishing the body after exercise, reducing fever, improving longevity, encouraging sleep, soothing sore throats and improving your sex life. However, none of this would have been news to serious chocoholics who have felt intuitively for years that chocolate can cure just about anything.

But recently such claims have been the focus of intense study by legitimate scientists keen to understand more about specific nutrients. Some of these studies have been funded by the cocoa industry, some have been independently funded but received their cocoa and chocolate supplies gratis from companies like Mars or the American Cocoa Research Institute, a non-profit group funded by the chocolate industry. At first glance it would be easy to put such studies on a par with a McDonalds study on the health benefits of a Big Mac. But the nutrients in chocolate are real and measurable and would exist no matter who funded the study or provided the test chocolate.

How we choose to interpret such data is vital. You can, for instance, ignore the spin that chocolate, in the form that it is usually consumed, is a 'health food'. Nevertheless, data about healthful nutrients in chocolate is now being confirmed by independent researchers and is turning up some intriguing possibilities.

More than a mood boost

Think about the 'benefits' of chocolate and its widely publicised mood lifting and addictive qualities are often the first things to come to mind. Chocolate contains caffeine (though only about as much as a cup of decaf), and other stimulants such as theobromine that can theoretically provide a mild rush. Most high volume commercial bars also contain sugar in varying amounts – the source of another short term high, but one that is inevitably followed by the sneaky backhanded low that indicates exhausted insulin supplies.

Chocolate also contains a cannabinoid-like substance known as anandamide that binds to the same receptors in the body as tetrahydrocannabinol (THC, the main psychoactive chemical in cannabis). Rumoured to be the real source of the legendary chocolate high,

this has never been proven by any reliable data. In fact it is estimated that a person weighing 9st 3lb (130lb) would have to eat 25lb of chocolate all in one go to get a true 'high' from it.

Instead what has emerged from the scientification of chocolate is that it has practical and measurable benefits that go beyond any real or imagined emotional high.

A functional food

In the past five years the data has been rolling in. In 2002 a small study published in *The Journal of the American Medical Association* pronounced that regular moderate chocolate consumption protected the heart by thinning the blood in much the same way as low dose aspirin.

In an earlier study published in 2000 in *The American Journal of Clinical Nutrition*, 25 grams (approximately an ounce) of semi-sweet dark chocolate was even pitted against low dose (81mg)

aspirin to see which was best at thinning blood. Both the chocolate and the aspirin worked equally well. This blood thinning action is an important finding since

when blood platelets (cells) stick together it is a major risk for blood clots, stroke and heart attack.

In 2004, a small independently-funded study conducted at the University of California at San Francisco's Department of Physiological Nursing found a link between the flavanols in chocolate and improved functioning of blood vessels, thus reducing the risk of blocked arteries.

That same year in London, tests conducted by the National Heart and Lung Institute found that a substance in chocolate can help defeat a winter cough. The British researchers tested a group of healthy non-smokers and found that one of the stimulants in cocoa, theobromine, was more effective than codeine, a traditional cough suppressant, for soothing a sore throat. In a similar vein, a study in the journal *Cellular Immunology* suggested that several constituents of chocolate even have an immune enhancing effect.

In October of this year a team of scientists from California and Germany, reporting in *The Journal of Nutrition*, found one of the historical uses of cocoa beans, as a treatment for diarrhoea, might have some merit. Their laboratory study found that substances in cocoa could limit the secretion of the fluids that cause diarrhoea – a finding that could lead to the development of supplements to ease the condition. However, at a pinch dark chocolate, which contains high concentrations of cocoa, may offer some relief by itself.

Another recent and independently funded Italian study found that consuming dark chocolate not only lowered blood pressure and cholesterol levels, it also improved the body's ability to process sugar.

An antioxidant boost

Most of these health benefits are linked to the high level of antioxidants – specifically flavonols and polyphenols – it contains. Antioxidants are an important part of the diet because they help fight the damage to body tissues and organs caused by the continual exposure to pollutants, hydrogenated fats and other everyday chemicals. As our body tries to metabolise these toxins, reactive molecules called free radicals are produced. In fact, free radicals are also produced naturally by all metabolic processes – the problem is when the body is overwhelmed with these highly reactive molecules, they begin to attack vital tissues. Antioxidants help deflect and mitigate the damage.

Chocolate's flavonoid content is surprisingly high – a 40g (1 1/4oz) serving of dark chocolate contains about 400mg of antioxidants – equivalent to a glass of red wine. Milk chocolate contains about half this much but white chocolate (which isn't really 'chocolate' at all but an odd mixture of milk, sugar and fat) contains no health promoting antioxidants at all. Plain unsweetened cocoa powder, according to scientists at the US Department of Agriculture (USDA), contains the highest level of flavonols, but adding sugar and milk to it substantially reduces its antioxidant levels.

A review in the medical journal *The Lancet* in 1999 suggests that chocolate's main antioxidants catechin and epicatechin are the same ones that give green tea its anti-cancer properties. Other studies confirm the presence of these powerful antioxidants. One study, published in 2003 in the ultra conservative journal *Nature*, concluded that the right kind of chocolate given in the right way could provide the body with the same health benefits – such as lower risk of cancer, lower blood pressure and lower risk of stroke – as antioxidant-rich fruits and vegetables.

The *Nature* study gave volunteers either 100g of plain chocolate or 200g of milk chocolate with or without a glass of milk. Drinking milk with the chocolate interfered with the absorption of the antioxidants. But dark chocolate on its own raises levels of the antioxidant epicatechin in the blood by 20 per cent.

If you are still not convinced, consider the conclusions of a 1998 study by researchers at the Harvard School of Public Health. This ongoing independent study, which has over many years

chocolate protects the heart
in much the same way as low
dose aspirin

provided volumes of data about what makes people healthy, followed 7,800 male Harvard graduates across 80 years and found that those who eat chocolate (and other sweets) up to three times a month live on average 1 year longer than those who overindulge, or who avoid sweets altogether. So maybe that comforting old saying is true: a little of what you fancy really does do you good.

But there's a catch

Naturally there's a downside. The way that most commercial cocoa powder and chocolate syrup is produced destroys its natural nutritional value. The cacao bean and its bran have the highest polyphenol levels, but heating and processing can strip the nutritional value of the bean away and polyphenol levels in the end product can vary

enormously – just like they can in teas and wines. Exposing it to an alkali as in Dutch chocolate further destroys chocolate's antioxidant content.

When chocolate manufacturers started to get positive results from these studies, they began to make outrageous claims for the 'health food' status of their products. Meanwhile behind the scenes they also began to look for money-making patented ways to reintroduce back into commercially available bars some of the flavonoids destroyed by their own harsh processing methods.

Having realised they could potentially and legitimately market chocolate as a functional food, big companies like Mars are now working on ways of processing chocolate to maintain its polyphenol content. In the US, for instance, Mars has developed a proprietary method for processing



FAIR TRADE?

The six largest cocoa producing countries are the Ivory Coast, Ghana, Indonesia, Nigeria, Brazil, and Cameroon. More than 90 per cent of the world's cocoa is grown on small family farms in these countries. Most cocoa farmers are trapped in poverty and forced to rely on child labour and even child slavery to make ends meet. The major chocolate companies such as

According to a recent report by the Global Exchange (www.globalexchange.org), progress in this area is slow. It notes, for instance, that while America is the biggest chocolate consuming country in the world, with consumers spending £7 billion (\$13 billion) annually on chocolate, fair trade chocolate makes up only one per cent of this market.

It's not lack of interest by consumers that keeps Fair Trade chocolate off the market. It is the reluctance of big business to exchange a minute proportion of its profits to ensure better working conditions and a living wage for cocoa farmers. M&M/Mars is the largest chocolate and candy company in the world, with annual sales of more than £11 billion (\$20 billion). Its position in the marketplace means that M&M/Mars also has the greatest responsibility and the most resources to offer Fair Trade chocolate on a wide scale. Yet the company consistently refuses to do so, relying instead on the industry Protocol – a document issued in 2001 which laid out the industry's commitment to end abusive and forced labour on cocoa farms by 2005 – and other development projects to sort out the problems of cocoa growers. The UK's biggest chocolate producer Cadbury Schweppes also places its faith in the Protocol rather than direct, effective action to improve the lot of cocoa farmers.

The problem is that putting something in writing doesn't make it so and to date little concrete progress has been made with regard to the goals of the Protocol. In addition the Protocol does not address some very specific problems, such as the way cocoa prices are kept low by major corporations who control every aspect of the world market. This means that for every pound spent on chocolate, these huge companies get 70 pence while farmers get only five pence. In West Africa cocoa revenues average £16-60 (\$30-108) per year per family member, not nearly enough to cover their costs or meet their basic needs.

In 2000, Fair Trade cocoa co-ops produced 89 million pounds of cocoa, but because of the refusal of companies like Mars to enter into fair trade agreements, only three million pounds were sold at Fair Trade prices.

Mars, Cadbury, Nestle and Hershey exacerbate these problems by refusing to take part in Fair Trade schemes that guarantee:

- A stable living wage under direct long-term contracts and access to credit, ensuring that farmers can cover the costs of labour, production, and meet basic needs over the longer term.
- Farmers are organised into democratic cooperatives that have control of their own production and marketing, promoting continued self-sufficiency.
- The prohibition of abusive child labour and forced labour, while ensuring sufficient wages for hired workers.
- Compliance of labour and wage standards through yearly independent monitoring.
- Records kept of all farmer sales, offering the ability to trace cocoa directly to the farm of origin.
- Farmer cooperatives reserve a portion of their revenues for community development projects and farmer training, removing the need for outside charity and ensuring that 100 per cent of funds earmarked for development work go to the communities that need them.
- Environmentally sustainable farming methods such as organic and shade cultivation, ensuring that farmers use methods that benefit the earth and maintain community health.

the beans, called Cocompro, which preserves polyphenol content. Some of their products in the US now carry the Cocompro label.

This begs the question, however: rather than choose a scientifically engineered bar, why not choose one that has been carefully grown and processed from the beginning? Whatever the advantages of a bar containing standardised amounts of polyphenols may be, it is still a bar of conventional chocolate grown in ecologically

unsound ways and containing traces of contaminants, the risks of which outweigh any potential benefits.

Cocoa without carcinogens

Buying organic chocolate, for instance, ensures that you are not consuming dangerous contaminants. At least 30 pesticides are used in growing cocoa. According to the *Annual Report of the Working Party on Pesticides Residues 1998*, around 75 per cent of samples of European chocolate tested contained low levels of carcinogenic lindane – a hormone disrupting, carcinogenic pesticide linked with breast cancer – which is banned in six countries including the UK and severely restricted in another 18, but is still widely used in cocoa producing countries.

Some of the other pesticides that can legally contaminate non-organic chocolate include:

Methyl Bromide linked with prostate cancer, kidney and liver effects, neurological effects

Pyrethrins carcinogenic and a cause of reproductive and developmental toxicity, neurotoxicity

Hydrogen Cyanide acutely toxic, causes thyroid damage and nerve degeneration

Naled a central nervous system disruptor, causes headaches, nausea and diarrhoea

Glyphosate carcinogenic, damages digestive system tissue, causes genetic damage and reproductive effects

Organically grown chocolate means you avoid these toxins. It also often has a richer, more chocolatey flavour because of the way the beans are grown. Cocoa plants thrive in the shade of the rainforest – their natural habitat – where favourable nutrients and the lack of direct sunlight give the cocoa plant its best possible growing conditions.

Thriving in the dark

The shade versus sun argument is important not just for the taste of the chocolate but for its entire method of production, for the sustainability of cocoa plantations and for the safety of cocoa farmers.

Cocoa is a naturally shade loving plant. Plants grown in the sun in areas of forest that have been specially cleared to make way for large plantations are markedly different from those grown under a natural forest canopy.

The manifold problems of sun grown cocoa include:

- Increased use of pesticides. Heavy and generally under-regulated pesticide use is an integral part of full sun systems. Whether used in shade or sun systems, pesticide application in cocoa production

GOOD CHOCOLATE, BAD CHOCOLATE

WHAT TO LOOK FOR ON THE LABEL

Cocoa beans, like coffee beans, are fermented, roasted and ground for use. The beans come in three primary species: Criollo, Forastero and Trinitario. The Criollo has been compared to Arabica coffee, in that it is the cream of the crop and has the most delicate and complex array of flavours. The Forastero can be compared to Robusta coffee in its disease resistance and higher yield, but whereas Robusta has a fairly crude taste, Forastero has a strong if somewhat one-dimensional cocoa flavour. Well-prepared Forastero is what goes into most conventional chocolate bars. Finally, Trinitario is a hybrid of the two, and can have various characteristics of both types.

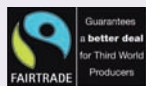
Chances are your average bar of chocolate will not tell you what kind of cocoa bean or beans went into it. Unless you are a chocolate connoisseur who actively seeks out single bean or single estate chocolate, you probably won't care either. Besides, the rich range of flavours in different kinds of chocolate grown in different parts of the world make the taste more rewarding when the beans are blended.

What most of us need to know is how to get the best from our chocolate bar, so consider these tips.

Think dark thoughts. The health benefits of chocolate lie in its cocoa content not its dairy content, so one way for chocolate lovers to get the best out of chocolate is to switch from milk chocolate (which can contain as little as 10 per cent cocoa solids) to semi-sweet or dark chocolate (which has at least 70 per cent cocoa solids and less sugar). Switching to bars with a higher percentage of cocoa solids also means more sales for cocoa farmers.

Read the label. Avoid bars with hydrogenated or partially hydrogenated oils. These oils are added to improve the mouth feel of highly processed chocolate bars that have had all the natural (and in health terms largely neutral) fats taken out of them. Avoid also those bars that list preservatives, flavourings or colourings, again a sign of poor quality starting ingredients and overprocessing.

Look for the Fair Trade logo. It means that cocoa farmers get a fair living wage from their cocoa, it supports sustainable cocoa production.



Buy organic. This guarantees your bar will be free of harmful pesticides – better for you, better for the farmer and better for the environment.

Moderation. More is not better and the health benefits of chocolate can be destroyed if you overindulge. As a rule of thumb, limit yourself to 30g (1oz), three or four times a week. This is approximately what the average Brit eats anyway, so this shouldn't be too much of a hardship.

You get what you pay for. Good chocolate is never cheap. Cheap chocolate is never good. Eating less of a quality chocolate will be more deeply satisfying than any amount of sugary, largely tasteless, commercially available bars.

75 per cent of samples of European chocolate tested contained low levels of carcinogenic lindane

can have adverse impacts on the environment and human health. Many of the chemicals used, such as chlordane, endosulfan and DDT, are banned in most developed countries. Poisoning from pesticide contamination is common among plantation workers.

■ Increased use of fertilisers. Full-sun systems necessitate greater use of water and nitrogen-based fertilisers. These increase soil erosion and acidification, decrease the soil's fertility, pollute drinking water, and cause damage to aquatic habitats. Increased soil erosion can also cause devastating landslides and flooding during weather emergencies.

■ Direct loss of species biodiversity. Clearance of shade trees greatly reduces the biodiversity of the area. This loss increases the economic dependence of farmers on a single crop (eg cocoa) by reducing secondary production (for example, firewood, timber, medicines and fruit) to near zero.

A 2003 report entitled *Venture Capitalism for a Tropical Forest* produced by the Worldwatch Institute even went so far as to suggest that cocoa grown in the shade could help preserve and restore the northern part of the Brazilian Atlantic forest. The report highlighted that if Brazil, the world's fifth largest cocoa-producing country, engaged in producing cocoa products on an ecologically and socially sound basis it would boost its domestic industry, provide rural employment and support the conservation of the Atlantic Forest biome – a 'biodiversity hotspot' and a global priority for conservation – that contains as many as 476 tree species in a single hectare (about 2.5 acres). That's the highest level of tree species diversity per unit area ever recorded anywhere on earth.

While there's no guarantee that the organic chocolate you buy has been grown under a natural rainforest canopy, the chances are much better than if you buy non-organic chocolate, which is generally grown in direct sunlight.

When cocoa is grown as nature intended, everybody wins. Free from the burden of toxic biocides and working with fair trade schemes, farmers, labourers and their environment stay healthy and productive. And for millions of chocolate lovers worldwide the humble chocolate bar is restored to a simple pleasure, instead of a guilty one.

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HOME

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www.ecotopia.co.uk, Tel; 01453 752345

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www.bishopstontrading.co.uk, Tel 0117 924 5598

The Ecologist apologises for mistakes made in this company's advert in last issue's 'Ethical Christmas' feature.


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Essential directory

The Ecologist's guide to ethical businesses and organisations

BABY

Make the first 21 months of your child's life calmer and easier by cutting down on clutter and making sure everything you buy is natural

ACCESSORIES

Beaming Baby.....	0800 0345 672
Born.....	0845 130 2676
Eco Babes.....	01366 387 851
Ecobaby Basics.....	01223 811 633
Ecotopia.....	01453 752 345
Heghog.....	0845 606 6487
Green Baby.....	0870 240 6894
Golden Lamb Rugs.....	01600 740 252
Little Earthlings.....	02829 541 214
Little Green Earthlets.....	08701 624 462
Lollipop.....	01736 799 512
Muladula.....	01453 768 549
Natural Collection.....	0870 331 3333
Natural Nursery, The.....	0845 890 1665
SoOrganic.com.....	0800 1692579
Spirit of Nature.....	0870 725 9885

CLOTHING

Baby Organics.....	020 8255 4040
Baby-O.....	0870 760 7552
Born.....	01179 245080
Clothworks.....	01225 309 218
Cut4Cloth.....	01326 340 956
Global Kids.....	01530 457 146
Gossypium.....	01273 488 721
Greenfibres.....	0845 330 3440
Greenscene.....	07813 282 566
Greensleeves Clothing.....	020 8458 1559
Healthy House, The.....	01453 752 216
Heghog.....	0845 606 6487
Huggababy.....	0870 046 4844
Natural Nursery.....	0845 890 1665
Nature's Fibres.....	01622 853 517
Organics for Kids.....	01865 311 410
People Tree.....	020 7739 0660
Schmidt Natural Clothing.....	0845 345 0498
Su Su Ma Ma World Wear.....	01273 300 606
Texture.....	020 7241 0990
Tiny Sprout.....	01892 863 646
Tatty Bumpkin.....	01732 812 212

FOOD

Baby Organix.....	0800 39 3511
Babynat Organic.....	01189 510 518
Hipp.....	0871 871 6611
Holle Baby Foods.....	01386 792 622
Mums 4.....	01926 771 285
Organico (see ad back cover ad).....	0118 951 0518
Truuuly Scrumptious.....	01761 239 300

NAPPIES

ECO DISPOSABLE	
Natural Baby Company	01983 810 925
www.naturalbabycompany.com	
Naturebotts.....	0845 226 2186
See Saw.....	0131 2281939
The Bottom Line.....	01543 250 810
RE-USABLE	
Born	0845 130 2676
www.borndirect.com	
The Nappy Lady.....	0845 456 2441
Natural Nursery.....	0845 890 1665
Nature Botts.....	0845 226 2186
Sam I Am.....	01522 778 926
Smile Child.....	0800 1956 982
Snazypants.....	01522 778 440
Twinkle Twinkle.....	0118 934 2120
NAPPY LAUNDRY SERVICES	
Dinky Diapers.....	0117 986 6167
Nappy Ever After.....	020 7383 5115
Nappy Tales.....	01235 812 747
Natural Nappies.....	01376 563 787
Nifty Nappies.....	01420 549 659
Number1 for Nappies.....	01992 713 665
The Nappy Box.....	01423 358 571
The Scottish Nappy Company.....	0800 015 5570
Tops for Bottoms.....	0151 343 1356

TOILETRIES

Earth Friendly Baby.....	020 8424 8844
Green People.....	08702 401 444

TOYS

Arujo.....	01295 271 218
British Toy-makers Guild.....	01225 442 440
Escor Toys.....	01202 591 081
Gaia Distribution.....	01225 484 472
Green Board Game Company.....	01494 538 999
Heghog.....	0845 606 6487
Holz Toys.....	0845 130 8697
in2play.....	0845 890 1392
Myriad.....	01725 517 085
Tatty Bumpkin.....	01732 812 212
Toys for Children.....	01594 824 007
Tulip Toys.....	01709 546 778

ORGANISATIONS

Baby Milk Action.....	01223 464420
Real Nappy Association.....	01983 401959
The Nappy Lady.....	0845 4562441
Women's Environmental Network.....	020 7481 9004

CAREERS & RECRUITMENT

In your next water break why not call a few of these numbers... You don't want to be a hamster all your life, do you?

The British Ecological Society.....	020 8871 9797
Charity Action Recruitment.....	020 7378 5441
Charity Connections.....	020 7202 9000
Charity Job.....	020 8390 1177
Countryside Jobs Service.....	01947 896 007
Eden Recruitment.....	0870 787 7630
Ends Environmental Job Search.....	020 7814 5309
Environment Job.....	0161 282 0920
Environment Jobs.....	01977 690 698

The Ethical Careers Service.....	01865 245 678
Evergreen Resources.....	01256 314 620
Execucare.....	020 7761 0700
Getalife.....	0161 277 5200
The Green Group.....	01268 468 000
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One World.....	020 7239 1400

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DRINK

MAIL ORDER

BEER AND CIDER

Beers In A Box.....	01924 489 222
Black Isle Organic Beers.....	01463 811 871
Dunkerton's Traditional Cider and Perry.....	01544 388 653
Freedom Organic Beer.....	020 8748 0903
Fuller's Vintage Ale.....	020 8996 2085
Hambleton Ales.....	01845 567 460
Houston Brewery.....	01505 614 528
O'Hanlons.....	01404 822 412
Only Fine Beer.....	01245 255 579
Organic Brewhouse.....	01326 241 555
Pennard Organic Wines & Cider.....	01749 860 393
Smiles Brewing Company.....	01275 375 878
Skinner's Brewery.....	01872 271 885
St. Peter's Brewery.....	01986 782 322
Valhalla Brewery.....	01957 711 658
Weston's Cider.....	01531 660 233

COFFEE

The Bean Shop.....	01738 449 955
Burgil Coffee.....	020 8560 0263
Café Direct.....	020 7490 9520
Equal Exchange.....	0131 220 3484
Hampstead Tea and Coffee Co.....	020 8731 9833
Hehlis Holistics.....	020 8660 7954
More Organics.....	0173 636 6008
Organico (see ad back cover).....	0118 951 0518
Origin.....	01326 340 320

The Tea and Coffee Plant.....	020 7655 4574
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SPIRITS

Juniper Green Organic Gin.....	01483 894 650
The Organic Spirits Company.....	01483 894 650

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Eleven O' Clock Tea.....	01635 278 648
E-Teas.....	0800 849 4039
Hampstead Tea and The Coffee Co.....	020 8731 9833
Hehlis Holistics.....	020 8660 7954
Nothing But Tea.....	0123 485 3855
The Tea and Coffee Plant.....	020 7655 4574

WINE

Pennard Organic Wines & Cider.....	0174 986 0393
Sedlescombe Organic Vineyard.....	0800 980 2884
The Organic Wine Company.....	01494 446 557
Vinceremos.....	08001 0073086
Vintage Roots.....	0800 980 4992

FOOD

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DAIRY

BUTTER & CREAM

Yeo Valley.....	01278 652 243
Rachel's Organic Dairy.....	01970 625805

CHEESE MAIL ORDER

Bath Soft Cheese.....	01225 331 601
Birdwood Farmhouse Cheesemakers.....	01452 750248
Caws Cenarth Cheese.....	0123 971 0432
Daylesford Organic.....	01608 731 700
Godminster Vintage Cheese.....	0174 981 3733
H.S. Bourne.....	01948 770214
Llanboidy Cheesemakers.....	01994 448303
Llanglofan Farmhouse Cheese.....	01348 891241
Loch Arthur Creamery.....	01387 760296
Staffordshire Organic Cheese.....	01782 680366

CHEESE PRODUCERS

Alhamwood Cheeses.....	01749 880 221
Caerfai Cheeses.....	01437 720 548

ICE CREAM MAIL ORDER

September Organic Dairy.....	01544 312 910
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MILK PRODUCER

Classic Organic – flavoured milk.....	01691 650450
Daylesford Organic.....	01608 731 700
Manor Farm Organic Milk Ltd.....	01300 341 415
Rachel's Organic Dairy.....	01970 625805
Yeo Valley.....	01278 652 243

YOGHURT

Rachel's Organic Dairy.....	01970 625805
Yeo Valley.....	01278 652 243

FISH

ORGANICO
0118 951 05118
www.organico.co.uk

FLOUR

Dove's farm.....	01488 684880
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FOOD BUYING COOPERATIVE

True Foods Community Co-op.....	0845 3308272
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- 2 ...getting it delivered to a neighbour?
- 3 ...having it delivered to your local newsagent/ chip shop, etc?
- 4 ...arranging for the provider to hide it somewhere?

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Bedford
David Catlin.....01525 861 452

BERKSHIRE

Reading
Ellis Organics0118 9722826
Organico0118 951 0518
Tolhurst Organic Produce.....0118 9843 428

BUCKINGHAMSHIRE

Wendover
Fieldfare Organic and Natural ...0845 601 3240
Buckingham
Right 2 Know01280 822 050

CAMBRIDGESHIRE

Cambridge
Waterland Organics01223 812 912
Royston
Guilden Gate Smallholding01763 243 960
Wisbech
Organic Connections International01945 773 374

CHESHIRE

Chester
Organicfair01244 400 158
Lymm
Cheshire Organics01925 758 575
Malpas
Oakcroft Organic Gardens01948 860 213
Northwich
Stockley Farm Organics01565 777 492
Sale
The O Zone0161 291 8862
Warrington
Northern Harvest0845 602 3309

CORNWALL

Saltash

A & N Health Foods.....01752 844 926
St Agnes
Tree Of Life Organics01872 552 661
St Austell
Cotna Organics01726 844 827
St Martins-by-Looe
Keveral Farmers.....01503 250 135
Truro
Hendra Farm Organics01872 572 301

CUMBRIA

Brampton
Eva Botanicals.....01697 741 906
Lady Jane's Tea Room07941 731 255
Grange over Sands
Howbarrow Organic Farm01539 536330

DERBYSHIRE

Ashbourne
Meynell Langley Organic Food...01332 824 815
New House Organic Farm01335 342 429
Adams, Nick.....01335 360 996
Chesterfield
The Organic Stores.....01244 881 209
Derby
Organic Pumpkin01332 370 254
Glossop
The Green Box company.....01457 856 843
Matlock
Beano's Wholefoods.....01629 57130
New Mills
The Organic Shop01663 747 550

DEVON

Barnstaple
Lugg Smallholding01598 710 558
Beaworthy
Earthstar, Little East Lake Farm...01409 221 417
Holsworthy Organics.....01409 221 417
Bideford
Marshford Organic Produce01271 322 855

Bovey Tracey
Yarner01364 661 503
Buckfastleigh
Riverford Organic Vegetables0845 600 2311
Crediton
Linscombe Farm01363 84291
Exeter
Shilvingford Organics01392 832 729
RodandBens01392 833 833
Elder, D01392 860 856
Great Cummins Farm01647 61278
Ilfracombe
West Hill Farm01271 815 477
Kingsbridge
Alan's Apple.....01548 852 308
Newton Abbot
Dartmoor Direct Co-Operative...01364 631 528
Woodland Organics01803 813 760
Nature's Round07810 127 376
Pyworthy
Ceridwen Herbs01409 254 450
Tavistock
Tamar Organics01822 834 887
Tiverton
Ms Kate Palmer01884 861 269

DORSET

Bournemouth
Bourne Organic.....01202 778 516
Blandford Forum
Gold Hill Organic Farm.....01258 861 413
Bridport
Bothen Hill Produce01308 424 271
Dorchester
Longmeadow Organic Vegetables....01300 341 779
Ferndown
Sturts Farm Community01202 870 572
Pulham
Cannings Court Organic Farm...01258 818 035
Wimborne
Long Crichelel Organic
Walled Garden.....01258 830 295

DURHAM

Darlington
Acorn Dairy.....01325 466 999

ESSEX

Brentwood
Legg, RG.....01277 211 883
Halstead
Organic Choice01787 478 471
Ongar
Ashlyns Organic Farm01277 890 788
Fair Organics01277 890188

GLOUCESTERSHIRE

Cheltenham
Slipstream Organics01242 227 273
Dursley
Better For Organics01453 545 090
Lydney
La Bodega01594 844 841
Newnham on Severn
Campmill Village Trust.....01594 516 344
Tetbury
Bowldown Farms Ltd01666 890 224
Thornbury
Thornbury Organic Co-op.....01454 415 345
Wotton Under Edge
Whitfield Farm Organics.....0845 283 0232

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Chorlton-cum-Hardy
Chorlton Wholefoods0161 881 6399
Mossley
Mossley Organic And Fine Foods01457 837 743
Stockport
Limited Resources0161 477 2040
Whalley Range
Glebelands Market Garden Ltd..0161 718 5328

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Naturally Health Foods.....01264 332 375
Clanfield
Naturally Organic.....023 9236 0196
Heckfield
Park Farm Organics.....0118 932 6650
Lymington
Warborne Organic Farm.....01590 688 488
Southampton
Sunnyfields Organic023 80871408
Whitchurch
Laverstoke Park Produce01256 890 900

Harroway Organic Gardens.....01256 895 346

HEREFORDSHIRE

Bodenham
Butford Organics.....01568 797195
Hereford
Biosphere Organics01432 820 082
Green Acres Organic Growers...01568 797 045
Abundance Produce.....01981 540 181
Kingstone
Arkstone Mill Produce.....01981 251 135

HERTFORDSHIRE

Potters Bar
Everybody Organic Ltd.....01707 651 243
Watford
Farm2door01923 490 526

KENT

Ash
Ivy House Farm01304 812 437
Belvedere
Regent Health.....01322 446 244
Canterbury
Brockman, AG & Co.....01227 732 001
Ripple Farm Organics01227 730 898
Cobham
Luddlesdown Organic Farms Ltd.01474 813 376
Gravesend
Dabbs Place Organic Farm01474 815 393
Horsmonden
Simply Wild Food Company08456 586 141
Ightham
Church View Farm.....01732 886 680
Tunbridge Wells
Organic Health Shop, the.....01892 538 155
Wingham
Wingham Country Market01227 720 567

LANCASHIRE

Nelson
The Wholefood Depot Ltd01282 606 500
Lancaster
Growing With Grace01524 251 723
Ormskirk
Gielty, A&D01695 421 712
Preston
Growing with Nature01253 790 046
Flintoff, Libby01995 679 728

LEICESTERSHIRE

Barkby Thorpe
Picks Organic Farm Shop0116 2693 548
Countesthorpe
Bambury Organic Farm0116 247 8907
Loughborough
Manor Farm.....01509 646 413
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Naturally Good Food01455 556 878
Sapcote
Watts, DA01455 272 840
Thurmaston
Corner Plot Vegetables.....0116 2697 920

LINCOLNSHIRE

Barrow on Humber
Wheelbarrow Foods01469 530 721
Boston
Woodlands Farm.....01205 722 491
Grantham
Goodacre, JM & A.....01476 860 228
Spalding
Sadd, BM.....01945 440 388
Spilsby
Eden Farms01790 763 582

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EC2
The Organic Delivery Company ..020 7739 8181
E5
UK5 Organics.....020 8806 0721
N4
Just Organic.....020 7704 2566
N7
Bumblebee.....020 7607 1936
SE10
Greenwich Organics.....020 8488 6764
SE2
Abel & Cole.....020 7737 3648
SE6
Capricorn Organics020 8306 2786
SE8
UK5Organics.....020 7237 7277
SW3
Here.....020 7351 4321

DIRECTORY GREEN PAGES

SW8
Food Ferry Company, the020 7498 0827
W12
The Fresh Food Co.....020 8749 8778

MERSEYSIDE

Thurstaston
Church Farm Organics.....0151 648 7838
Liverpool
Organic Direct.....0151 7076 949
Windmill Wholefood Co-op.....0151 7341 919

MIDLANDS, WEST

Birmingham
Organic Roots.....01564 822 294
Coventry
Down to Earth.....02476 677 500
Solihull
Hopwood Organic Farm.....0121 711 1187

NORFOLK

Attleborough
Arthur's Organic Deliveries.....01953 887 582
King's Lynn
Abbey Farm Organics.....01485 609 094
Norwich
Stable Organics.....01263 577 468
Barker Organics.....01263 768 966
Paradise Organics.....01508 494 260
The Greenhouse.....01603 631 007
The Green Grocers.....01603 250 000
Salle Moor Hall Farm.....01603 879 046
Eostre.....01953 789 000

NORTHAMPTONSHIRE

Daventry
Goodness Direct.....08718 716 611
Kettering
Arcadia Organics.....01536 525 298
Milton Keynes
Organic Trail.....01908 568 952
Northampton
Leafcycles.....01604 628 956

NORTHERN IRELAND

County Down
Burrenwood Produce.....02843 771 844

NORTHUMBERLAND

Alnwick
Rock Midstead Organic Farm.....01665 579 225
Bedlington
North East Organic Growers.....01670 821 070
Berwick Upon Tweed
The Green Shop.....01289 305566
Corbridge
Cropped Up.....07947 856 641

NOTTINGHAMSHIRE

Bingham
Farmshop Home Delivery.....0800 169 7009

Cossall
Trinity Farm.....0115 944 2545
Nottingham.....
Roots Natural Foods.....0115 960 9014

OXFORDSHIRE

North Aston
North Aston Organics.....01869 347 702
Chipping Norton
Chipping Norton Organics.....01608 642 973
Sarsden Organics.....01608 659 670

SHROPSHIRE

Craven Arms
Organic By Order.....01588 660 747
Dawley
Food For Thought.....01952 630 145
Oswestry
Doggart, A.....01691 652 166
Shrewsbury
Boxfresh Organics Direct.....01952 770 006

SOMERSET

Bath
Norwood Farm.....01373 834 856
Truuly Scumtious Organic
Baby Food Ltd.....01761 239 300
Bridgwater
IYB Partnership.....01278 733 080
Bristol
Leigh Court Farm.....01275 375 756
Langport
Park Lane.....01458 252 901
Lower Claverham
Arcadia Organics.....01934 838 634
Milverton
Spring Grove Market Garden.....07956 429 531
South Petherton
Flaxdrayton Farm.....01460 241 427
Somerset Organic Link.....01460 241 427
Taunton
Prockters Farm Shop.....01823 413 427

STAFFORDSHIRE

Stafford
Bella Herbs.....01785 663 868
Grove Farm Organics.....01785 780 252
Stoke-On-Trent
The Real Food Company.....01270 873 322

SUFFOLK

Beccles
Jim Cooper Vegetables.....07866 960 706
Bury St Edmunds
Longwood Farm.....01638 717 120
Eye
Daganya Farm.....01379 668 060
Ipswich
Hillside Nurseries.....01473 652 682
Newmarket
DJ Produce Ltd.....01638 552 709
Saxmundham

Swallow Organics.....01728 668 201

SURREY

Cranleigh
Sunshine Organics.....01483 268 014
Redhill
Greener Greens.....01737 766 792
Worplesdon
Horti. Halcyon.....01483 232 095

SUSSEX

Barnham
Willow Nursery.....01243 552 852
Brighton
Real Food Direct.....01273 621 222
Chichester
Wayside Organics.....01243 779 716
The Whole Food Shop.....01243 790 901
Hartfield
Beans and Things.....01273 477 774
Harvest Supplies.....01342 823 392
Lewes
Barcombe Nurseries.....01273 400 011
Landsdown Health Foods.....01273 474 681
Mayfield
Herons Folly Garden.....01435 873 608
Midhurst
Down to Earth.....01730 815 133
Plumpton
Ashurst Organics.....01273 891 219

WARWICKSHIRE

Atherstone
Mythe Farm Organic Produce.....01827 712 367
Leamington Spa
Gaia.....01926 338 805
Long Itchington
Reality Bites Organic
Market Gardens.....07780 688 271
Rugby
The Wholefood Shop.....01788 567 757
Wild & Free.....01788 570 400
Warwick
Warwick Health Foods.....01926 494 311

WILTSHIRE

Charlton
Green Cuisine.....01666 824 584
Chippenham
The Organic Experience.....01249 720 274
Tallywacker Farm.....01249 750 035
Swindon
Barker, DI & AM.....01793 770 219
Coleshill Organics.....01793 861 070
Warminster
Pertwood Partners.....01747 820499
Yatesbury
Yatesbury Organics.....01672 539 191

WORCESTERSHIRE

Pershore
Oxton Organics.....01386 860 477

YORKSHIRE, EAST

Driffield
Green Growers.....01377 255 362
Hull
Arthur Street Trading Co.....01482 576 374
Slater Organics.....01964 527 519
North Cave
HNP Direct.com.....01430 425 531

YORKSHIRE, NORTH

Cowthorpe
Goosemoorgans.....01423 358 887
Kirkbymoorside
Farndale Free Range Ltd.....01751 430 323
Northallerton
Low Leases Organic Farm.....01609 748 177
Robinson, DS.....01609 772 032
Richmond
Hazelbrow Organic Farm.....01748 886 224
Farm-A-Round.....020 7627 8066
Bluebell Organics.....07759 832 234
Tadcaster
The Organic Pantry.....01937 531 693
Whitby
First Season.....01947 601608
Pasture Cottage Organics.....01947 840 075
York
Yo Aspin Organics.....01439 771 848

YORKSHIRE, SOUTH

Sheffield
Beanies.....0114 2681 662
Down To Earth.....0114 2685 220

YORKSHIRE, WEST

Hebden Bridge
Valley Garden Organics.....01422 846 651
Huddersfield
Half Moon Healthfoods.....01484 456 392
Natural Choice.....01484 513 162
Leeds
Love Organic!.....01132 663 030
Pontefract
Brickyard Organics.....01977 617 327
Shipley
Bradford Wholefoods.....01422 202 648
Wetherby
Goosemoor Organic Produce.....01423 358 887

SCOTLAND

Aberdeen
Lembas.....01569 731746
Ardrrossan
Wildly Organic.....01294 472075
Armadae Pier
Rubha Phoil Forest Garden.....01471 844700
Birkhill
Bee-Organic.....01382 581186
Cupar
Bellfield Organic Nursery.....01337 860764
Dumbarton
Epo Growers.....01389 875337
Edinburgh
Grow Wild.....0131 443 7661
Damhead Organic Foods.....0131 448 2091
Glasgow
Roots & Fruits Wholefoods
& Organics.....0141 3393097
Glendale
Glendale Salads.....01470 511349
Inverness
Tio Ltd.....01667 462189
Macleod Organics.....01668 462555
Inverurie
Croft Organics.....01467 981717
Kirriemuir
Angus Organics Ltd.....01575 540294
Kyle of Lochalsh
Raasay Walled Garden.....01378 660345
Newmacher
Ward, Colin, J.....01651 862041
Pencaitland
East Coast Organic Boxes.....01875 340227
Perth
Bellfield Organic Nursery.....01738 850589
Stonehaven
Fraser, J & M.....01569 730195
Tarbolton
Stair Organic Growers.....01292 541369
Tarskavaig
Achnaich.....01471 855315
Turriff
Greeness Organics.....01888 544877

WALES

Anglesey
Foreman, Helen.....01407 742 293
Bangor
Dimensions Health Store.....01248 351 562
Brecon
Beacons Vegi Boxes.....01874 636 785
The Cilliau.....01874 711 224
Builth Wells
The Cilliau.....07887 656 887
Caerphilly
Source, the.....029 2088 3236
Cardiff
Pulse Wholefoods.....02920 225 873
Spice of Life.....02920 487 146
Green Cuisine.....02920 498 721
Clunderwen
Ffynnon Farm.....01437 532 570
Deeside
Organic Stores.....01244 881 209
Haverford West
Sarra, Mr & T.....01437 762 323
Monmouth
Irma Fingal-Rock.....01600 712 372
Carrob Growers.....01600 714 529
Pwllheli
Ty'n Lon Uchaf.....01766 810 915
Llangybi Organics.....01766 819 109
Swansea
Jade Gate Organic Produce.....01792 232 643



MEAT

WHERE DO YOU GET YOUR MEAT?



Might there be a different way of buying meat that works well for you, that could guarantee better quality and give you a cleaner conscience? Could you buy locally, buying direct from the people who actually farm the animals that

produce the meat? Or could you use a butcher who can tell you where all his or her meat comes from, and get special things for you when you want them?

BOX DELIVERY

BERKSHIRE

Lambourn
Sheepdrove Organic Farm01488 71659

CAMBRIDGESHIRE

Ely
Naturally Yours.....01353 778 723

CORNWALL

Cusgarne
Cusgarne Organics.....01872 865 922
Penzance
Vivian Olds Ltd.....01736 788 520
Truro
Carleys of Cornwall.....01872 277 686
Mewton PG01872 540 343
Nuncarrow Organic Farm.....01872 540 343
Tywardreath
Stoneybridge Organics01726 813 858

CUMBRIA

Carlisle
Whiteholme Farm01697 748 058
Grange-Over-Sands
Howbarrow Organic Farm01539 536 330

DERBYSHIRE

Ashbourne
Nix Organix.....01335 360 996

DEVON

Exeter
The Organic Farmers Market.....01392 875 678
Holsworthy
Providence Farm Meats.....01409 254 421
Kingswear
Fountain Violet Farm01803 752 363
Okehampton
Fishleigh Estate.....01837 810 124
Umberleigh
Higher Hacknell Meat01769 560 909

DORSET

Beaminster
Childhay Manor Organics01308 868 709

GLOUCESTERSHIRE

Berkeley
Adeys Farm Meats01453 511 218

LONDON

Ealing
Thorogoods of Ealing.....020 8567 0339
Notting Hill
Lidgate.....020 7727 8243

MIDLANDS, WEST

Birmingham
Rossiter, S & A.....0121 4581 598

NORFOLK

Norwich
Harveys Puremeat.....01603 621 930

NORTHUMBERLAND

Hexham
Northumbrian Quality Meats01434 270 184

OXFORDSHIRE

Wantage
Real Farm Foods Ltd.01235 762 461

SOMERSET

Exmoor
Brown Cow Organics.....01749 890 298
Shepton Mallet
Hindon Organic Farm.....01643 705 244
Bath
Radford Mill Farm01761 479 572
Taunton
Stoneage Organics.....01823 432 488

SUFFOLK

Woodbridge
Red Poll Meats.....01728 748 444

SURREY

Shere
Drydown Farm07941 277 545
Wintney
Organically Speaking01483 531 319
Bramley
Wintershall Partnership01483 892167

SUSSEX, WEST

Billingshurst
Steepwood Farm.....01403 785 434

WARWICKSHIRE

Rugby
Browning, GNF & GA.....01926 632 246

WILTSHIRE

Swindon
Purton House.....01793 770 219

YORKSHIRE, EAST

Driffield
Barmston Organics01262 468 128

SCOTLAND

Perth
Hugh Grierson.....01738 730201

WALES

Clyro
Clyro Hill Farm01497 820520

MAIL ORDER

Daylesford Organic.....01608 731 700
Graig Farm Organics.....0159 785 1655
Higher Hacknell Farm.....0176 956 0909
Meatshop0122 857 7329
Natural Good Food01455 556878
Save the Bacon0160 469 6859
Sheepdrove Organic Farm0148 871 659
Swaddles0845 456 1768
The May Highland Beef.....0157 042 3080
The Organic Beef Company0148 866 8429
The Real Meat Company.....0198 584 0562
Traditional Norfolk Poultry0195 349 8434
Well Hung Meat0845 230 3131

FASHION

GENERAL

And Albert01482 863 068
Bishopston Trading Company.....01453 766 355
Chandni Chowk.....01179 300 059
Cloths Works01225 309 218
Daily Bread Co-Operative01604 621 531
Epona01914 151 201
Ethical Wares01570 471 155
Ford Barton01398 351 139
Ganesha London.....020 7928 3444
Garthenor01570 493 347
Gossypium01273 488 721
Green Fibres0845 330 3440
SEE ADVERT ON PAGE 85
Grounded020 7503 0279
Hemp Union01482 225 328
Hug.....0845 130 1525
Isle of Mull Weavers.....01681 700 265
Marlo Clothing.....01736 753 254
Myriad Organics.....01584 872 665
Natural Collection0870 331 3333
Natural Dye Company.....01258 840 549
One World Shop01312 294 541
Organic Attire Co020 7924 3345
Patagonia0033 450 88 44 44
People Tree020 7739 0660

Schmidt Natural Clothing.....0845 345 0498
Shared Earth01904 632 896
Siesta01227 464 614
Spirit of Nature0870 725 9885
Spurriergate Centre.....01904 629 393
Texture.....020 7241 0990
Terramar Organics.....07929 371684
Treehouse TLC.....01970 625 116
Traidcraft.....01914 911 001
World of Difference.....01788 579 191

SHOES

Birkenstock020 7240 2783
Ethical Wares01570 471 155
Fairdeal Trading0870 766 5796
Green Shoes01803 864 997
Vegetarian Shoes01273 691 913

T-SHIRTS

Equop0117 953 9991
FunkyGandhi.com07979 993 533
Howies.....01239 614 122
Terramar Organics.....07929 371684
THTC020 8630 9001
Tonic T-shirts07838 250 749

FUNERALS

COFFINS

Eco Coffins.....01303 850 856
Greenfield Coffins01440 788 886

FUNERALS

Alternative Funerals0800 197 0401
Arka.....01273 746 011

Celtic Casket.....01283 521 104
The Funeral Company Ltd01908 225 222
Green Endings020 7424 0345
The Natural Death Centre0871 288 2098
S. Stibbards & Sons01702 558 717
Sawd Partnership.....01795 472 262
Somerset Willow Co.....01278 424 003
Willow Weave.....01953 887 107

GARDENS



ALL PURPOSE

British Eco.....0191 209 4161
Natural Collection.....0870 331 3333
Organic Gardening
Pinetum01452 750 402
The Catalogue0845 130 1304
Tamar Organics.....01822 834 887
The Green Shop.....01452 770 629

COMPOSTING

Blackwall01132 018 000
Dorset Hills Organics.....02392 691 913
Enviromulch01215 254 326
Fertile Fibre01584 781 575
Globe Organic Services Ltd0800 018 4120
Humus Wyse01803 834 687
KPS Composting Services.....01444 831 010
Original Organics Ltd01884 841 515
Pinetum01452 750 402
The Bin Company.....0845 6023 630
The Composting Association.....0870 160 3270
The Recycle Works01254 820 088
The Worm Hotel01606 592 145
Wiggly Wigglers01981 500 391
Wonder Worms01422 831 112

FENCING

Evalast Fencing Systems Ltd.....01772 687 779

FERTILISERS

Glenside Organics Ltd01786 816 655
Greenvale Farms Ltd01677 422 953
Growthanic Ltd01380 871 050

Pinetum01452 750 402

GARDEN FURNITURE

Duchy Originals.....020 8831 6800
English Hurdle.....01823 698 418
Pendlewood.....01617 894 441
Re-Form Furniture01209 711 581
Wayfarer Products.....01924 492 300

NURSERIES AND GARDENS

Butterworths' Organic
Fruit Nursery01290 551 088
Ryton Organic Gardens02476 303 517
Walcot Organic Nursery01386 553 697

PEST CONTROL

Agralan01285 860 015
Defenders Ltd01233 813 121
Scarletts Plant Care.....01206 240 466

POTS AND SUPPORTS

Panda Stix.....01623 648 200
Stakepots.....01246 261 798

SEEDS

Association Kokopelli Organic
Seeds01227 731 815

WATER TREATMENT

Green Ways01962 761 600
Pinetum01452 750 402
Raindrain Lt01924 468 564

HEALTH & BEAUTY



You can absorb up to two kilos of chemicals through toiletries and cosmetics each year. So throw away all your toxic beauty products and choose these ones that are kind to your body as well as the environment

COSMETICS & BEAUTY TREATMENTS

Avea	.....870 1999 219
Aveda	.....8000 747712
Barefoot Botanicals	.....0870 220 2273
Beauty Without Cruelty	.....01229 775185
Beauty Naturals	.....0800 980 6662
Dr. Hauschka Natural Skin Care	01386 792 622
Earthbound Organics	.....01597 851157
John Masters Organics	.....01874 730 979
Lavera	.....01557 870 203
Mybeingwell.com	.....01326 377555
Organica J	.....01330 850257
Primavera Aromatherapy	.....01373 812640
Suvarna Pure and Natural Cosmetics	.....01695 728286

DEODORANT

Anne Elise Natural Skincare	.....01304 374 594
Body Organics	.....0870 870 8586
Dr. Hauschka Natural Skin Care	01386 792 622
PitRok Ltd	.....0208 5631120
Weleda	.....0115 9448200

MENSTRUAL PRODUCTS

Natracare	.....01275 371 764
Menses	.....0117 9851646
The Mooncup	.....01273 673845

SOAPS

Caurnie Soaperie	.....0141 776 1218
Heihog	.....0845 606 6487
Simply Soaps	.....01603 720 869
The Soap Kitchen	.....01805 622944
Woodspirits	.....0208 2934949

THE ECOLOGIST REGULARLY SHAMES THOSE COMPANIES WHO USE DANGEROUS CHEMICALS IN THEIR "SKINCARE" PRODUCTS, and our readers want to know what the alternatives are. To advertise your product call Zayda on 020 7351 3578

SUN PROTECTION

Aubrey Organics	.....1-800-282-7394
Dr. Hauschka Natural Skin Care	01386 792 622
Ecolani	.....1-800-625-5240
Neal's Yard	.....020 7498 1686
Yaoh	.....0117 9239053

TOILETRIES

Akamuti	.....0845 4589242
Ascent	.....01497 847788
Beauty Naturals	.....0800 980 6662
Body Organics	.....0870 870 8586
Bio-D Company Ltd	.....01482 229950
Caurnie Soaperie	.....0141 776 1218
Cioccolatina	.....01189473178
Comfort and Joy	.....01367 850278
Creightons Naturally Plc	.....01903 745611
Dolma	.....0115 9634237
Dr. Hauschka Natural Skin Care	01386 792 622
Essentially Yours	.....01372 465 414
Earthbound Organics	.....01597 851157
Faith in Nature	.....0161 7642555
Farrow and Humphreys Ltd	.....01780 482400
Greenfibres	.....0845 330 3440
Green People	.....01444 4011444
Hemp Garden	.....01288 355572
Honesty Cosmetics	.....01629 814 888
John Masters Organics	.....01874 730 979
Lavera	.....01557 870 203
Licesnatcher (UK & Ireland)	.....0845 004 2808
Mariposa Alternative Bodycare	.....01273 242925
Mother Earth	.....01229 885266
Mybeingwell.com	.....01326 377555
Naturisimo.com	.....020 75847815
Neal's Yard Remedies	.....020 7498 1686
Nirvana Natural	.....01494 880885
Organic Blue	.....020 84248844
Organic Botanicals	.....01273 773182
The Organic Health Shop	.....01892 538155
Potions and Possibilities	.....01394 386161
Primavera Aromatherapy	.....01373 812640
Pure Nuff Stuff	.....01736 366008
Pure Potions	.....01273 555 123
Right 2 Know	.....01280 822 050
Simply Nature	.....01580 201687
SoOrganic.com	.....0800 1692579
Spiezia Organics Ltd	.....0870 8508851
There Must be a Better Way	.....01118 9479352
The Organic Pharmacy	.....020 73512232
Think Natural	.....0845 6011948
Twinkle Twinkle	.....01118 934 2120

TOOTH PASTE

Green People	.....01444 4011444
Kingfisher Toothpaste	.....01603 630484

HOLIDAYS

The following holidays have all been recommended to us by friends and family. We hope you enjoy them as much as they did, and if you know of any other places that Ecologist readers might enjoy please email editorial@theecologist.org

THE ECOLOGE

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HOME

From ingenious, easy-to-fit water-saving devices, to reclaimed building materials: everything you'll need to renovate and clean your home without harming the environment is in these listings

ENERGY

ELECTRICITY: suppliers	
Ecotricity	.....08000 326 100
Good Energy	.....0845 456 1640
Green Energy	.....0845 456 9550
Generation	
Dulas Ltd	.....01654 705 000
Green Dragon Energy	.....01654 761 731
Rainbow Solar Trading	.....01983 533 129
Sustainable Energy Installations	01256 392 704
Wind and Sun Ltd	.....01568 760 671
EFFICIENCY: Energy saving	
Eco-Exmoor Ltd	.....01598 763 595
Energy and Environment	.....0161 881 1383
ESI	.....01481 722 299
Lumin8	.....01233 666 000
The Organic Energy Company	.....0845 458 4076
Light bulbs	
Lampholder 2000	.....01536 520 101
Lumin8	.....01233 666 000
Insulation	
Construction Resources	.....020 7450 2211
Ecomerchant	.....01795 530 130

Products Ltd	.....01484 854 898
Green Building Store	.....01484 854 898
The Green Shop	.....01452 770 629
Green systems	.....01763 260 719
Greener Living	.....02392 664700
Heraklith UK Ltd	.....01628 784 330
Klober Ltd	.....01934 853 224
Polarwall Ltd	.....01392 841 777
Second Nature	.....01768 486 285
Thermafleece	.....01768 486 285

HEATING

Ground Source	
Dando Geothermal	.....01903 731 312
Earthwise Scotland Ltd	.....01330 833 915
Eco Heat Pumps	.....01142 962 227
Geoscience Ltd	.....01326 211 070
Geothermal Heating International	.....02476 673 131
Green Systems	.....01763 260719
Groenholland UK Ltd	.....07905 508 726
Ground Source Solutions Ltd	.....01246 822 808
Ice Energy	.....01865 882 202
Kensa Engineering Ltd	.....01326 377 627



Source4U01926 498 444
 Toby's Reclamation01392 833 499
 Viking Reclamations01302 835 449

Self-build homes

Association for Environment
 Conscious Building01559 370 908
 Association of Self Builders07041 544 126
 Ecological Design Association01453 765 575
 Insideout Buildings01524 737 999

Tiles

Natural Tile01285 642 300
 Siesta Cork Tile Co020 8683 4055

Timber

Altham Hardwood Centre01282 771 618
 Ecomerchant01795 530 130
 SEE AD ON PAGE 86
 Rawnsley Woodland Products01208 813 490
 Reclaimed Pine Online01202 789 868
 Reclaimed Timber Specialists020 8558 2811
 Victorian Wood Works020 8534 1000

Windows and doors

Ecomerchant01795 530 130
 SEE AD ON PAGE 86
 Environmental Construction
 Products Ltd01484 854 898
 Merewood Joinery01614 800 363
 Preston Door & Pine Stripping01772 725 943

BEDDING AND LINENS

Green Fibres0845 330 3440
 Schmidt Natural Clothing0845 3450 498
 Texture020 7241 0990
 Willey Winkle01432 268 018

CLEANING

21st Century Health0800 0260 220
 Aqua Ball0800 026 0220
 Bio-D Company Ltd01482 229 950
 Down to Earth01793 732 000
 Ecotopia01453 752 345
 Ecover0845 130 2230
 Green Fibres01803 868001
 Greenlands01892 871 285
 Insight Eco Store01273 245 958
 The Healthy House01453 752 216
 Natural Eco Trading Ltd01892 616 871
 Vertue020 8806 7294
 Wonderwash Laundry Ball01611 832 7788

FURNITURE & FURNISHINGS

New

Arbor Vetum01386 840 438
 Golden Lamb Rugs01600 740 252
 Grand Illusions01747 854 092
 Insight Eco Store01273 245 958
 Lombok020 7736 0001
 Rawnsley Woodland Products01208 813 490
 Senior & Carmichael01737 844 316
 thingbuilder07779 623 964
 Treske Ltd01845 522 770

Recycled & Salvage

African Trackwoods01488 686 850
 Architectural Salvage Centre020 8459 2947
 Art-eco07792 702 735
 D & A Binders020 7609 6300
 Living Concepts020 8378 1009
 Reclaimed Pine Online01202 789 868
 Reel Furniture01603 629 396
 thingbuilder07779 623 964

Solar Thermal

Future Heating Ltd020 8351 9360
 Green Shop Solar01452 770 629
 Green Systems01763 260719
 HiTech Energy Ltd0845 601 3540
 The Organic Energy Company0845 458 4076
 Power Tech Solar08707 300 111
 Radiant Energy01522 525 300
 The Solar Design Company01511 606 0207
 Solarsense UK Ltd01275 394 139
 Solar Twin0845 130 0137
 Sun Harvester01786 822 827
 West Wales Solar Heating01994 419 439

Wood Fuel & Stoves

3G energi01573 229 198
 Able Fuels Ltd01484 515 578
 Beacon Stoves01559 371 058
 Bio Energy Devices01446 781 415
 Bioenergy Technology Ltd01825 890 140
 Chilli Penguin Stoves02920 865 536
 Construction Resources020 7450 2211
 ebc wood fuels01953 455 854
 Green Systems01763 260719
 Rural Energy Ltd01664 454 989
 Wood Energy Ltd01398 351 349

Conservation Engineering Ltd01359 269 360
 Conservation Resources020 7450 2211
 Eco Logic01217 663 016
 Flow Control Water
 Conservation Ltd08707 558 811
 Flowco Mariflo Ltd020 8330 2487
 Green Building Store01484 854 898
 SEE ADVERT ON PAGE 85
 Hippo the Water Saver01989 766 667

Filters

Aqua Vitae01404 841 841
 Aquasaver Ltd01288 354 425
 Capital Water Treatment020 8649 9503
 Earthly Goods01480 812 004
 Eden0800 917 0977
 Green-way services01202 874 413
 Pure H2O08080 820 820
 Simply Water00353 149 20414
 Tap Magic01473 252 043
 The Healthy House01453 752216

Rainwater harvesting

Construction Resources020 7450 2211
 Envireau Rainwater Management01296 633 000
 Free Rain01636 894905
 Rainharvesting Systems01452 772 000

PROFESSIONAL SERVICES

Architects

Chris Morton, Herefordshire01684 541 480
 Finch Macintosh Architects,
 Winchester01962 855 240
 Goddard Wybor practice,
 West Yorkshire01132 666 044
 Jon Allen, London020 8961 3279
 Neill Lewis, Worcestershire01684 563 356
 Nicholas Hare0207 607 4433
 Quattro Design, Bristol01179 299 672
 Quentin Alder, Bristol01179 683 111

Building consultants

Cob in Cornwall01326 231 773
 Concept Timber01225 792 949
 Mike Wye and Associates01409 281 644

Building contractors

Ecorenovations01611 442 0666

Carpenters

J.G.Horning, Devon01803 732 135
 Richard Arnold, Devon01884 350 51
 Tom Straker, Herefordshire01432 853 113

Energy consultant

Encraft08456 022 874

Roofing specialist

Rawnsley Woodland Projects01208 813 490

WATER

Conservation

Celtic Water Management01239 811 465

HOME RENOVATIONS

Flooring

Ashcroft Reclaimed
 Timber Flooring01243 554 769
 Construction Resources020 7450 2211
 Drummonds Architectural
 Antiques01428 609 444
 Forbo-Nairn Ltd01592 643 777
 Rawnsley Woodland Products01208 813 490
 Reclaimed020 8558 2811
 Treesave Reclamation Ltd01787 227 272
 Treework Flooring01275 464 466
 Yorkshire Reclaimed Flooring01937 843 532

Paints & paint remover

Auro Organic Paints01452 772 020
 Construction Resources020 7450 2211
 Earth & Reed Ltd01449 722 255
 Earth Born Paints01928 734 171
 Ecopaints0845 345 7725
 Eco Solutions Ltd01934 844 484
 Green Building Store01484 854 898
 SEE ADVERT ON PAGE 22
 LILL01296 714 184
 Little Green Paint Company01611 230 0880
 Lizzy Induni Traditional Paints01929 423 776
 Nutshell Natural Paints0136 473 801
 The Green Shop01452 770 629

Recycled materials (incl. salvage)

Smile Plastics01743 850 267

OFFICE RESOURCES



ELECTRICITY

Ecotricity0800 0326 100
 Good Energy01249 766 090
 Green Energy08454 569 550

GRAPHIC DESIGN

Alternation01285 888 672
 Ecographic01273 201 361
 Sussed Design01273 275 302
 Zodshop01239 711 638

INK CARTRIDGES

Action Aid Recycling08453 100 200
 The Green Stationary Company01225 480 556
 Office Green020 8592 9998

JANITORIAL

Environment Saving Supplies024 7638 6544
 Greenlands Environmental Care01892 871 285
 Vertue020 8806 7294

PR

Substance PR0238 023 5050

PROMOTIONAL MATERIALS

Remarkable!020 8741 1234
 Save a Cup01494 510 167
 Yo-Yo Promotions01252 620 593

RECYCLED OFFICE SUPPLIES

Dartex Office Supplies01322 521 545
 The Green Stationary Company01225 480 556
 Paperback020 8980 2233
 Recycle It08707 743 762

STATIONERY

Ecotopia01453 752 345
 The Green Stationary Company01225 480 556
 Remarkable!020 8741 1234

TELEPHONE & INTERNET

Alternation01285 888 672
 Green ISP0845 058 0659
 GreenNet08450 554 011
 The Phone Co-op08454 589 000

WATER COOLERS

Aquaid01223 830 400
 Simply Water01514 755 589

PERSONALS

Want to meet people, or just a special person with a passion for global issues? Visit <http://www.ethicalcentral.com/personals/> today, and make a difference to your tomorrow!

PERSONAL FINANCE

Do you want your hard-earned cash to finance wars, vivisection, or child labour? Or do you want it to support environmentally sound products and businesses? If the latter, call the organisations listed below

BANKING

Co-Operative Bank.....08457 212 212
Ecology Building Society0845 674 5566
Triodos Bank0117 973 9339

FINANCIAL SERVICES

Ethical Investment Co-operative 0845 458 3127
Gaeia0161 434 4681
Naturesave01803 864 390
Rathbone Greenbank
Investments0117 930 3000

Social Venture Network.....07958 772 864

INSURANCE

Absolute Mortgages01865 865 342
C I S Insurance.....0161 829 4084
Ecology Building Society01535 650 777

MORTGAGES

Absolute Mortgages01865 865 342
CD Project.....0795 877 2864
Ethical Investment Co-operative 0845 458 3127

PERSONAL TRANSPORT



71 per cent of road trips by car are less than five miles long, and 46 per cent are less than two miles long. So why not leave the car keys on the kitchen table and make better use of your local transport network?

BICYCLE

ORGANISATIONS
London Cycling Campaign020 7928 7220
Sustrans0117 929 0888
UK National Cyclists Organisation 0870 873 006

BUS

Travel Line.....08706 082 608

CAR

Bio-diesel fuel
Ebony Solutions01606 301 222

Breakdown

Environmental
Transport Association0800 212 810

Electric cars

Electric Car Association01823 480 196

Electric scooters

Powabyke01225 443 737
Electric Scooters01206 233 180

Fuel-saving devices

Eco Tek01844 212 939
Power Plus01323 417 700

Recycling used motor oil

Oil Bank.....0800 663 366

Recycled tyres

Environmental Tyre Disposal.....020 8345 6115
Tyre Collection Services.....0121 544 1408
REG Tyre and
Automotive Recycling01895 444 714

Sharing

Lift Share0870 11 11 99
Car Clubs01132 349 299

TRAIN

TIMETABLE INFORMATION

National Rail Enquiries.....0845 748 49 50

PROPERTY

BELFAST. 11 room, 3 storey house built 1850. Ideal for large family or group, and for retreat/courses/holidays. Unspoilt but modern wiring and plumbing. Double glazed, masonry stove, 2 ton wood burning stove. Two acres of forest and conservation garden. 1,000 ft above sea level. **Only £500,000.Tel 02890 716200**

RECYCLING SERVICES



More than 60 per cent of your rubbish can be recycled. Most of it currently ends up in landfill sites or disappearing up incinerator chimneys. Don't bin it, recycle it

ALL PURPOSE

Forest Recycling Project Ltd.....020 8539 3856
Loop0800 542 1400
Paper Round.....020 7620 3131
RECOUP.....01733 390 021
Waste Watch.....0870 243 0136

ALUMINIUM

Alcan Aluminum Can Recycling...0800 262 465
Alufoil020 8583 5060
Aluminium Packaging
Recycling Organisation.....01216 334 656
Alupro.....01506 444 644
Cash for Cans0845 722 722

BATTERIES

Centre for Alternative
Technology01654 705 950

BICYCLES

Re-cycle0845 458 0854
Salvo.....020 8400 6222

CARPETS

Carpet Burns.....0133 259 4044

CARTONS

Cutouts.....01484 645 281
Tetrapak.....0870 442 6000

CDS

Beacon Press01825 768 611

CLOTHING

Oxfam01865 312 610
Red Cross020 7235 5454

CURTAINS

The Curtain Exchange020 7731 8316

COINS

Oxfam.....0870 333 2700
RNIB0845 766 9999

COMPUTERS

DonateaPC.....info@donateapc.org.uk
Recycle It0870 774 3762
Free Computers for Education...01932 874 066

ELECTRONIC AND HAZARDOUS WASTE

Strategic Waste
Management Services.....0113 243 8777

FURNITURE

Furniture Recycling Network01924 375 252
Homestore E. London.....020 8519 6264

INK AND TONER CARTRIDGES

Office Green020 8592 9998
UK Cartridge Recycling
Association01706 525 050

MOBILE PHONES

Fonebak.....01708 683 400

OIL

Actionsmart01656 648 899
Oil Recycling Association.....01279 814 035

PAINT

Community repaint020 8362 0752

PAPER

British Recovered Paper
Association01793 889 600

PLASTIC CUPS

Remarkable.....020 8741 1234

Save-a-cup.....01494 510 167

REFRIDGERATORS

Fridge Recycling.....01925 715 400

SPECS AND SUNGLASSES

Vision Aid Overseas.....01293 535 016

TELEPHONE DIRECTORIES

Yellgroup.....0800 555 444

TV MONITORS/ MERCURY LIGHT BULBS

Lamp recycling.....01752 662 050

Mercury Recycling.....0161 877 0977

Wiser.....01480 462 232

STORECUPBOARD



Too busy to make it to the shops? Then let them come to you. As well as the fruit and vegetable box schemes listed on page 91, there is a wealth of companies who deliver all your weekly needs right to your door.

NATIONWIDE

Barleywood Walled Garden.....0117 935 1725
 Community Foods.....020 8450 9411
 Duchy Originals.....020 8831 6800
 Eostre Organics Ltd.....0195 378 9639
 Equal Exchange.....0131 220 3484
 Essential Trading Cooperative.....0117 958 3550
 Everybody Organic.....0170 765 1243
 Goodness Direct.....0871 871 6611
 Graig Farm Organics.....0159 785 1655
 Infinity Foods Cooperative Food..0127 342 4060

Mother Hemp.....0126 242 1100
 Natural Good Foods.....01455 556878
 Oil in the Raw.....0157 935 1178
 Organico (see back cover ad)0118 951 0158
 Suma.....0845 458 2290
 The Organic Delivery Company...020 7739 8181
 Traidcraft.....0870 443 1018
 Westcountry Organics.....0164 724 724
 Wild Oats.....0117 973 1967



200,000 PEOPLE READ THE ECOLOGIST EVERY MONTH

This is a big audience ready to support small businesses which offer products which are fairly traded. To advertise call Zayda on 020 7351 3578

VOLUNTEERING



Increasingly, volunteers are holding the fabric of the world together. Whether it's social cement that's needed or physical labouring, many of today's communities couldn't survive without thousands of hours of donated time. Are you doing your bit?

RESOURCES

Action Without Borders.....001 212 843 3973
 Environmentjob.co.uk.....0161 2820 920
 Volunteering England.....0845 305 6979

UK

BTCV.....01302 572 244
 Environ.....0116 2220 222
 Ethical Consumer.....0161 226 2929
 Groundwork.....0121 236 8565
 Time Bank.....020 7401 5420

INTERNATIONAL

MAY ALSO OFFER UK PROJECTS

Africa and Asia Venture.....01380 729 009
 African Conservation Experience0870 2415 816
 Bio Sphere Expeditions.....01502 583 085
 Coral Cay.....0870 750 0668
 Cross-Cultural Solutions.....001 914 632 0022
 Earthwatch Institute.....01865 318 838
 Friends of the Earth.....020 7490 0881
 Outreach International.....01458 274 957
 Project Trust.....01879 230 444
 Quest Overseas.....020 8673 3313
 Student Partnership Worldwide...020 7222 0138
 Trekforce.....020 7828 2275
 VSO (Volunteering Advice Line)..020 8780 7500
 VWOOF.....01273 476 286

HELP RESTORE THE CALEDONIAN FOREST

on a Trees for Life volunteer work week in the beautiful Scottish Glens this spring and autumn.

More information from:

www.treesforlife.org.uk

Tel: 0845 458 3505

CAN YOU DESIGN A WEBSITE FOR A NETWORK OF COMMUNITY HERBAL PHARMACIES IN DEVELOPING COUNTRIES?

Interest in biodiversity, traditional knowledge and social enterprise; Spanish speaker all helpful. UK base Oxford.

Contact Ruth West

Tel 01865 245081

Email ruthwest@gn.apc.org

ORGANIC MARKET GARDEN

in Cheshire offers opportunity to learn. Free accommodation for part-time or full-time, plus some money. Vegetarian and non-smokers only. Free Yoga lessons.

Tel: 01948 860213 after 9.30pm

For professional help with your advertising phone our advertising manager on 0207 3513578

THE GIFT AND THE WORD



Children – What is ‘Giving’ at ‘Christmas’? What is it doing to us? This is the season where the supermodels march on us in earnest. The celebrities do their soft-shoe right off the label, they seem to push past the screen and plant a kiss on our bundled faces like bad weather made of pouring-down sex videos. There is a feeling in the air that the right wing apocalypse scheduled by Tony Blair and George Bush will not interrupt the monument of Christmas. First things first. That global warming, that Lake of Fire – it will happen as God wills it. But first we must pummel one another with plastic conveniences, schmazzle dazzle... oh my GOD. Christmas! What can you do? Try to gain copyright control on your own mind? My wayward flock, stay calm.

Corporate Christmas is the Total Falsehood that holds within it a great opportunity. Brave the neurotic elves and smiling Wal-Mart hostesses, look for a moment into that blinding darkness. Here is THE ECONOMY THAT WARS ON THE IDEA OF GIVING.

We can recover from disinformation. We can eventually heal from the official lies of the Fallujas and Katrinas. But how do we work our way out of the tinsel-choked smoke and mirrors that leave us saying Merry Christmas and meaning it’s opposite? When looking into the eyes of a loved one at Christmas only to find that the gaily wrapped box we are then handed is A TRAGIC INTERLOPER, NOT A GIFT AT ALL. Rather it is a demand – a demonstration of ‘Consumer confidence’, ie I’VE GOT CONFIDENCE IN THE CONTENTS OF THESE PRODUCTS, and what would that be? – hurricanes and

soup at the North Pole and toxins in your breath. Evil! The Reverend suggests that we do the brave thing and commit to a regimen utterly lacking in propriety. This Christmas, those of you who really believe – you shall stop inflicting on one another the symbolic corporate product, under the tree, over by the squealing little god in the manger.

Let us turn Christmas on itself and thus create the single gift that can come from that godforsaken Evilday... Listen now. Love is what we are discussing. The would-be gift-givers want to celebrate the year together. Lovely. I’m about to sob. But corporate marketing has known for some time how to meet the word ‘love[‘ with a high-tech echo that erases it. Captures it and pixilates it. Packages it and ships it into some globalised inventory. HAS LOVING COMMUNICATION VANISHED INTO PRODUCT SENTIMENTALITY FOREVER? Well, we have to re-learn a de-corporatised love.

What we will do today is a controlled experiment. We will find ONE GIFT that wasn’t delivered with the corporate lie. This gift will take the meaning of the word ‘love’ straight to us with no interference (with no Christmas, Incorporated, no right-wing Christian sponsorship). Listen to me – this gift will have to be pretty good. It will have to bring tears to our eyes with its unmistakable intimacy.

Rosa Park’s memorial is the gift. Our

act of remembering her life. The gift of Rosa’s act of bravery. The little lady who set off the Civil Rights Movement, whose refusal to give her seat to a white man, and whose arrest for that refusal created the Montgomery bus boycott and brought Martin Luther King to town. Our memory plays and re-plays it again and again – how the white man claims her place on that bus, and how she declines to move – in her quiet voice. This is a gift to us, a real gift of unsentimental love, and quite beyond the possibility of any corporate or fundamentalist tinkering with its meaning. There is no logo in the corner of Rosa Park’s bus.

Now you say – isn’t this a bit extreme, Reverend? I say thank god we have something as straightforwardly intimate as Rosa Parks to put against the corporate fourth quarter called Christmas. We have a way to find our way home in a world where oil companies greenwash

their logos and Bush/Blair say ‘security of our citizens’ when they mean the end of the world.

Here’s Reverend Billy’s gift idea: Go into a store and say in a clear voice what the truth about the company is. Don’t hurt yourself, don’t get arrested. Just talk for as long as Rosa did. Then give your loved one a description of your action, or film it or record it. Wrap it up nice, and smile a real unpaid-for smile. Now that is a real good gift.

Go into a store and proclaim the truth about the company. Don’t hurt yourself, don’t get arrested

PHOTOGRAPH BY FRED ASKEW

You know climate change is happening ...but what can you do to help?



What is ecotricity?

See encarta.msn.com.

e-co-tric-i-ty

noun

ecofriendly electricity: electric energy produced by ecologically friendly means, for example, by solar power or wind power (informal)

[Late 20th century. A blend of ecological and electricity.]

The biggest difference you can make is to change where your electricity comes from.

But choose carefully.

At ecotricity, we spend more per customer on building new sources of renewable energy than every other green supplier put together.*

We're the only supplier that takes all the money you spend on electricity and invests it in building new sources of green energy. That's why we're the only supplier used and recommended by both WWF and the Soil Association.

How do you switch?

It's easy. We do all the hard work for you. You can switch your home straight away by calling 08000 326 100 or visiting our website at www.ecotricity.com

...and it won't cost a penny more!

We promise to match the price of conventional electricity in each region of the UK.

* In 2004, ecotricity spent over £900 per customer building new sources of green energy. Our nearest competitor spent less than £9.

For more information please see www.whichgreen.com

ecotricity

Call us free on 08000 326 100

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Save the planet this Christmas...

again...



and...

again...



and again...



and again...



and again...



and again.



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Organic continental specialities available from: Direct Mail & Festive Hampers -
Graig Farm on 01597 851 655 and all good organic and fine food stores.