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YEARS OF
UNPRECEDENTED
UPHEAVAL AND
CHANGE ARE UPON US

THE END OF CHEAP OIL

HOW MANY OF US
WILL SURVIVE?

FARMED SALMON

Neon pink, toxic
and tasteless –
why are we still
eating it?

BATTERY CHILDREN

It's time to
let our kids
roam free

FLU VACCINE ROULETTE...

ARE YOU READY
TO PLAY?

BEHIND THE LABEL

Listerine
mouthwash

GREENING THE BLUES

Nature's
vital role
in tackling
depression



GREEN PAGES

OUR 26-PAGE GUIDE
TO ETHICAL LIVING

Hugh Fearnley-Whittingstall eats October
Monty Waldin drinks Albet i Noya
Plus: Pumpkins • Sea beet salad • Pickled walnuts
• 200+ ethical organisations





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THIS MONTH IN HISTORY: OCTOBER 1908

Henry Ford incorporated the Ford Motor Company in 1903, proclaiming, "I will build a car for the great multitude." In October 1908, he did so, offering the Model T for \$950. In the Model T's nineteen years of production, its price dipped as low as \$280. Nearly 15,500,000 were sold in the United States alone. The Model T heralds the beginning of the Motor Age; the car evolved from luxury item for the well-to-do to essential transportation for the ordinary man. Ford revolutionized manufacturing. By 1914, his Highland Park, Michigan plant, using innovative production techniques, could turn out a complete chassis every 93 minutes. This was a stunning improvement over the earlier production time of 728 minutes. Using a constantly-

moving assembly line, subdivision of labour, and careful coordination of operations, Ford realized huge gains in productivity. He cut the workday from nine to eight hours in order to convert the factory to a three-shift workday. Ford's mass-production techniques would eventually allow for the manufacture of a Model T every 24 seconds. Ford's affordable Model T irrevocably altered American society, from the growth of suburbia, to the creation of a national highway system, and a population entranced with the possibility of going anywhere anytime. Ford witnessed many of these changes during his lifetime, all the while personally longing for the agrarian lifestyle of his youth.

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www.theecologist.org; 01795 414 963

The Ecologist's International Serial Number is ISSN 0261-3131. The Ecologist is a member of the Independent News Collective (INK). Periodicals Postage Paid at Rahway, NJ. Postmaster: Send address corrections to: The Ecologist, c/o Mercury Airfreight International Ltd, 365 Blair Road, Avenel NJ 07001.

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Printed on Emerald FSC made from up to 75% recycled post-consumer waste and at least 17.5% certified pulp from well managed forest independently certified in accordance with the rules of the Forest Stewardship Council, supplied by Paperback under chain of custody SGS-COC-0621. FSC

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EDITORIAL



Supermarket giant Tesco's meteoric rise has almost exactly mirrored the demise of Britain's rural economy. So when Tesco announced record profits of £2 billion a few months ago, the news was met with a chorus of disapproval by most of Britain's farming organisations. Scotland's NFU declared that the viability of Scotland's food industry was at stake and called on all political parties to make fair trade a priority, a view echoed by The NFUs of Wales and Ulster, the National Beef Association, the Soil Association, the Tenant Farmers Association and countless smaller groups.

What is obvious to these farming groups is no less obvious to Action Aid, Friends of the Earth, the Federation of Small Businesses, the Women's Institute among many others who joined them in their call for action.

But despite this, had you checked the National Farmers Union's website on the day following Tesco's announcement — a day that could not have provided a more perfect opportunity for discussion about the tension between producers and retailers — you would have seen something quite different: a solitary press release describing the NFU's display stand at the Chelsea Flower Show. "Set within the Flower Pavilion," went the cheery announcement, "it will feature English Meadows with a grazing topiary steer and sheep, stone walling, a running water feature..."

Given that the NFU is the single most powerful organisation purporting to represent farmers, with a whopping £20 million income, an estimated £40 million stashed away in the bank and continual access to the key decision makers, they should have been the first in line. But they weren't. Why?

More than two thirds of food in Britain is sold through just four supermarket chains, and individual farmers, not surprisingly, haven't a hope of enjoying any kind of bargaining power with them. They are, as even Tony Blair has acknowledged, "in an armlock." As a result, roughly 40 dairy farmers go out of business each week, and all the signs suggest the same fate for many of our remaining farms. In which case, breaking that armlock ought to be the key priority of an organisation with a mandate to represent farmers.

But if you judge the NFU by its reaction to a resolution by its own members earlier this year "to fully investigate and support the drafting of a new, strengthened and legally binding supermarket Code of Practice with stricter terms; and to support the appointment of an independent supermarket watchdog to proactively monitor the effectiveness of the Code..." then it's clear that the NFU has little intention of confronting the supermarkets.

Its official response to the resolution begins by saying that "there is a belief [among many of the NFU's members] that there is now an imbalance of power in the supply chain and that this power is being abused. Whether, and indeed how this power is being abused is open to debate." The report goes on to suggest a voluntary Buyers Charter in place of the requested Code of Practice.

But a voluntary charter has been attempted in the past, with zero real success. Farmers continue to be squeezed. Supermarkets continue to sell below cost. According to Derek Mead, one of the NFU's 80 Council members, "the Buyers Charter is a way to reduce the heat for a strengthened Statutory Code of Conduct with an independent watchdog. The NFU should not only be signed up with the 'Breaking the Armlock Coalition' — it should be leading the field."

He's right. If the NFU refuses to defend farmers against the greatest threat they face, then the NFU, with its privileged access to parliament, overflowing war chest and ability to make a real difference, will have become their enemy, not their friend. And the only explanation for that betrayal will involve cowardice and more than a little vested interest.

Letters

ASPARTAME

Aspartame is the most controversial food additive in history. The most recent evidence, linking it to leukemia and lymphoma, has added substantial fuel to the ongoing protests of doctors, scientists and consumer groups who allege that this artificial sweetener should never have been released onto the market and that allowing it to remain in the food chain is killing us by degrees. **NET HOLDINGS**

DECEMBER 1965 While working on an alien ring, a team of paleontologists discovered a fossilized aspartame molecule in a 100-million-year-old rock. The molecule is identical to the one found in aspartame today.

AUTUMN 1967 Aspartame is found to be a neurotoxin. It causes holes in the brains of infant mice.

FEBRUARY 1970 FDA approves aspartame. It is found to be a neurotoxin. It causes holes in the brains of infant mice.

1965 Aspartame is found to be a neurotoxin. It causes holes in the brains of infant mice.

SPRING 1967 Aspartame is found to be a neurotoxin. It causes holes in the brains of infant mice.

SEPTEMBER 1971 FDA approves aspartame. It is found to be a neurotoxin. It causes holes in the brains of infant mice.

26 JULY 1974 FDA approves aspartame. It is found to be a neurotoxin. It causes holes in the brains of infant mice.

JULY 1975 Aspartame is found to be a neurotoxin. It causes holes in the brains of infant mice.

Dr. John Olney shows that Aspartic acid, one of aspartame's main constituents, causes holes in the brains of infant mice.

FDA APPROVAL IS WORTHLESS

Regarding your story on Aspartame (September 2005), there are hundreds of case histories and examples of corporate manipulation of the FDA approval processes, which are presently the subject of lawsuits. The recently adjudicated Vioxx case in Angleton, Texas, is an excellent example in which the widow won a judgment of a quarter of a billion dollars.

Aspartame, however, is a much better example, because it is a deadly neurotoxin on every grocery store shelf in the United States!

There were warning labels on tobacco products, even though the emphysema and lung cancer causation were really quite obvious; prescription pharmaceuticals might end up killing you, but you have to go through a prescription process signed by a physician in order to get most of them

Aspartame doesn't carry any warnings, except that phenylketonurics better avoid it. Phenylketonuria is a rare genetic condition, and most people are relatively sure that they are not a phenylketonuric, so why worry, it can't hurt them. After all, the FDA is there to protect them, and if it were really bad,

the FDA would have removed it from the market...

Eventually American leaders in science, in jurisprudence and in plaintiff law, are all going to wake up to the total extent of the folly implicit in perpetuating the FDA's pre-emptive power, especially in matters where millions of people's health is involved.

This is why members of New Mexico's Environmental Improvement Board are now considering changes to the law that would allow them to disregard the FDA's rulings on the safety of aspartame (and other food additives) and ban the sale of this product throughout the state. If enacted, New Mexico would lead the nation into a new era where the health of its citizens is vastly more important than perpetuating the destructive actions of corporations whose products have contributed enormously to the apparently inexorable demotion of the USA to 29th in the world in terms of longevity.

**Andrew Maniotis, PhD
University of Illinois at Chicago**

ARE THESE PEOPLE MAD?

I was listening to Radio 4 the other morning and

heard this bloke from some Canadian bank talking about the potential consequences of a bird flu pandemic among humans. He said there would be a complete worldwide stoppage of air transport, then of all other transport ('because the flu would hit those between 20 and 40 most' (?)), which would result in the shutdown of manufacturing due to lack of availability of parts, and shops running out of food because of lack of transport. So this interviewer guy says, 'So are you telling us to invest in gold?'

GOLD! I sat up in bed spluttering my tea over the duvet saying, 'Gold! What 'kin' use is GOLD going to be with no FOOD to buy?' ARE THESE PEOPLE MAD, BAD, IN DENIAL OR WHAT? **Thoughts on a postcard please to Zayda Kebede, Advertising Manager, The Ecologist.**

PARTY POLITICS

Whilst Paul Jennings presents an excellent argument against a new Ecology Party (New Ecology Party? That's the last thing we need, August 2005) I fear his Kropotkin/Bookchin inspired approach is unrealistically Utopian. Is it really possible that a green social movement could make the government irrelevant as he suggests? I doubt it.

Conversely, Aidan Rankin's proposal to create a new Ecology Party (*Ecologist*, February & May 2005) would probably lead to the Green Party and the new interloper becoming irrelevant minor parties due to both of them competing for the same votes in a first-past-the-post system.

Surely there can be a middle way. The ecology movement should be both

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a social and a political movement, rather than exclusively one or the other. Ideally all the political parties would be green parties. This is unlikely, but until that happens the existence of a strong Green Party can put pressure on the other parties to green up their act.

Perfection is impossible, although I can only hope that the more members the party has, the more it will represent the diverse range of opinion within the green movement and avert the authoritarian tendency that Mr Rankin currently sees within the party.

However, in other European countries there may well be a need for new ecology parties. For example, in those countries whose green parties supported both the Euro and the new EU Constitution (Germany and France etc), new ecology parties could be necessary to bring about a change within their green movements back to localisation, Schumacher inspired economics and a genuinely participatory democracy.

James Wild
London SE4

AM I REALLY HELPING?

One day in July, my parents were stuck in a traffic jam on the M25. Hundreds of people were left immobile on a hot day and when it became apparent that their predicament would last for quite some time, complete strangers began gathering on verges and between lanes to chat and pass time

Among the people my parents spent time with was a lorry driver, hauling a freight container of waste paper to a south coast port, to be shipped

to China.

This has led me to wonder whether 'just' recycling is quite enough anymore? After all, shipping is notorious for being one of the most highly polluting forms of transport known to man. Does the sheer act of taking paper for recycling halfway around the world before it could be used outweigh the potential saving of world resources?

I put my wine bottles (of which there are usually many!) and empty cans into the village recycling bins in the knowledge that money – albeit only a little – eventually trickles back into my local community. Everything else – plastics, Tetrapacks, paper, card, compost, textiles (the list is endless), I relentlessly drop off for recycling elsewhere on my travels.

Am I really helping, because I would hate to be making the situation worse? It's a frightening thought.

Alison Wright
Staffordshire, UK

IT'S ABOUT OIL, STUPID

Last week I heard a US religious broadcaster suggesting that the United States should 'take out' Hugo Chávez, the (democratically elected) president of Venezuela. Putting the 10 commandments to one side, I wondered what Chávez had done to rile this man of the cloth.

Apparently Chávez has been travelling the hemisphere offering preferential oil deals, barter, and loans to leftist and left-of-centre governments. In the past 30 days, the leader of the world's fifth-largest oil exporting country has inked deals with Argentina, Brazil, Uruguay, and Paraguay.

Thirteen Caribbean nations signed a deal for cheap oil in June. And since April, Cuba has been getting almost all its oil from Venezuela in exchange for doctors and gym teachers.

It is, Chávez says, his way of helping neighbouring countries cut energy costs and improve living standards in the region. 'Altruism,' says Eric Wingerter, a spokesman at the Venezuela Information Office in Washington, DC. And he added, 'This is part of a larger process involving regional solidarity and helping other countries economically.'

This looks suspiciously like another example of the US wanting (expecting) it all, and being prepared to consider 'taking out' anyone who gets too serious about working for a better world. Truly terrifying stuff, if you ask me.

I'm beginning to think that I might understand how the Jews must have felt during the rise of the Third Reich. Only this time, there is nowhere to escape to.

Arthur Bettle
Washington DC, US

ROTTEN FRUIT

Re: 'Better than real' (July/Aug 2005). I was in my local supermarket last week when I saw a display of heavily packaged fruit. Apparently, it was 'ripe and ready' to eat, and so being sold at a premium.

What world are we living in? The supermarkets pick fruit early so that we grow accustomed to buying fruit we can't eat for days, fruit that hasn't had time for its natural sugars to develop on the tree as they should have done. And then, having corrupted the reality of what fruit should taste like, the supermarkets sell us the opportunity to

buy 'ripe' fruit at inflated costs. When are we just going to say no?

Simon Warrilow,
Canterbury, Kent

DANGEROUS DRIVING?

About a year ago a relative died rather suddenly from what the hospital diagnosed as colon cancer. As a beneficiary of part of their estate, I thought about buying a new car. But haven't because every time I drove one – even for 10 minutes or so – I suffered real discomfort due to what I think was the 'finish' of the interior, or some kind of chemical or substance in the internal environment. It seemed to be affecting me round my head and my face, which became quite pink and inflamed. I also sensed something unnatural and nasty affecting my lower internal organs.

What has started to concern me is that, prior to this relative's passing, they purchased a brand new car. Could this have contributed to, hastened or even caused my relative's death? And I also wonder what the rates of colon cancer are among car salesmen.

I have been increasingly perturbed that these affects could be causing some serious cancers and other problems and I believe this needs further debate and investigation. I cannot publish my name out of respect to my family but would be interested to hear of anyone else with similar experiences or concerns via this magazine.

Name and address withheld

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



US STATES GO IT ALONE ON CLIMATE CHANGE

Unwilling to wait on the recalcitrant president, nine states in northeastern America are developing a scheme to cap and then reduce the level of greenhouse gas emissions from power plants, the first of any such plans in the country. California, Washington and Oregon are said to be considering similar schemes, with the combined pressure being seen as potentially strong enough to force the national government to adopt the laws nationwide.

Under the new scheme, known as the Regional Greenhouse Gas Initiative, New York, New Jersey, Connecticut, Delaware, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont would cap carbon dioxide emissions at 150 million tons a year – about the same as average emissions in the highest three years between 2000 and 2004. From 2015 the cap would then be lowered year on year, so that by 2020 emissions would have been cut by 10 per cent. The plan was led by New York Republican Governor George Pataki, who is also considering running for the White House next time, in 2008.

BUSH MAKES LIFE EASIER FOR 4X4S

In the month before the devastation wreaked by Hurricane Katrina, the Bush administration gave further proof of its disdain for the environment and the health of its citizens when it proposed a new set of fuel-economy standards for cars, which actually increase the allowable miles per gallon for 4x4s such as the notorious Hummer H2.

Six categories of fuel standard have been set, with larger trucks being allowed incrementally higher levels of fuel emissions, seen by many critics as an incentive for manufacturers to build larger vehicles so as to qualify for more lax standards. 'The proposal is almost embarrassing in terms of its effect on fuel consumption,' said Eric Haxthausen of Environmental Defense.

Almost?



HERO OR ZERO?



HERO: DOUG TOMPKINS

Who is he? Founder and former CEO of Esprit clothing turned saviour of the Chilean wilderness.

For the last eight years Doug Tompkins has spent over \$30 million of his own fortune trying to protect vast swathes of the South American rainforest. He's been accused of trying to set up a Zionist nation in South America, of colonial arrogance, and of jeopardising the country's right to develop. But last month, Tompkins finally proved those who doubted his motives wrong, when he donated more than 714,000 acres of almost untouched forest to a Chilean foundation that will run South America's biggest nature reserve.

Many former detractors were won over when they realised Tompkins' intentions were honourable, such as Senator Sergio Paez, representative of the southern part of Chile's Tenth Region, who had previously accused the former clothing magnate of trying to force settlers to sell him their land. Paez admitted he had 'talked to a lot of people and many people did get good money for their land and they were not taken advantage of, which was what I had feared.'

In all, Tompkins and his wife's charitable trusts own over 2m acres in Chile and Argentina and his ultimate goal is for Pumalin (the new park's name) to become part of the country's national park system – but only if it is guaranteed never be sold for development.

10

THOUSAND DOLLARS

The amount two Russian climate-change skeptics have bet British climatologist James Annan that the earth will cool over the next decade. Annan, however, is confident, commenting: 'There isn't much money in climate science and I'm still looking for that gold watch at retirement.'



INSIDE A DOG'S BRAIN

According to new research, dogs do in fact have a basic 'theory of mind'. An animal cognition researcher recorded 39 occasions of dogs play-fighting in a parkland setting. Depending on how distracted other dogs were, dogs eager to play would

use an escalating series of attention grabbing gestures, from barks, bites and bumps to running off then turning back. The results are seen as an indication that dogs can sense the degree of their play-partner's attention – suggesting that they have a basic theory of what is going on in their minds. If, by contrast, dogs had no awareness of mental processes, says researcher Alexandra Horowitz, their signals would have no correlation to the other dog's level of attention.

IRAQ VETERANS POISONED BY DEPLETED URANIUM

Early tests on returning soldiers from Iraq are showing worrying signs of depleted uranium (DU) poisoning. The *New York Daily News* paid for a small group of soldiers and one of its own reporters who had been to the war zone to be tested for DU contamination. Of the nine tested, four were found to be positive. When one of them found himself to be positive he had his unborn baby tested and results showed the foetus had a condition common to those with radioactive exposure: atypical syndactyly, meaning its right hand had only two fingers.

More than 3,000 tons of DU were used in Iraq. DU burns at high temperatures when it impacts with its target, giving off clouds of carcinogenic particles into the air. According to Dr Doug Rokke, a health physicist at the University of Illinois who headed up a Pentagon study of depleted uranium weapons in the mid-1990s, there is no safe way to use the weapons. 'DU is a war crime. It's that simple,' he said. 'Once you've scattered all this stuff around, and then refuse to clean it up, you've committed a war crime.'

Nonetheless, the Pentagon continues to insist, without having conducted proper field trials, that DU is safe.



WHAT WE LEARNT LAST MONTH...

■ **The number of UK woodland flower species, such as primroses, dropped by over a third between 1971 and 2001 as a result of 30 years of intensive farming, pollution, climate change and poor management.**

■ **Staffordshire County Council is going to pay someone a salary of £30,000 a year to tell people in the area to turn lights and computers off.**

■ **Autism was found to be virtually unknown among the Amish of Pennsylvania (who refuse to take vaccines).**

■ **Mumbai banned plastic bags in a bid to stop the flooding caused when they clog up the city's sewers.**

■ **While 400 million people in Asia tuned in to watch the *Mongolian Cow Sour Yogurt Supergirl Contest*, the Chinese equivalent of *Pop Idol*, the country's authorities criticised it for its 'worldliness'.**

■ **The Pet Love motel opened in Sao Paulo, Brazil, providing satin sheets, ceiling mirrors and cushions for when the animals get frisky.**

■ **Japanese scientists came up with a technique for controlling the direction a person walked by remote control.**

■ **Twice as much of the world is now affected by drought as 30 years ago.**

■ **South Korean scientists created world's first cloned dog**

■ **Meanwhile, scientists at the Safar Center for Resuscitation Research in Pittsburgh went one better (or worse) when they announced they had drained the blood from the bodies of 12 dogs, filled them with a replacement fluid – thus creating 'zombie' dogs who were clinically dead, with no heartbeat or brain activity – before reinfusing the blood three hours later and 'reincarnating' them with electric shocks.**

■ **An Australian man (called Shane) was reported to be teaching mice to surf.**



TRAFFIC GIVES CHILDREN CANCER

Childhood cancer is linked to exposure to traffic exhaust fumes, according to new research in the *Journal of Epidemiology & Community Health*. Professor George Knox, emeritus professor of Epidemiology at Birmingham University, studied data on 22,500 children who had died from cancer, mapping out how near they lived to pollution hotspots such as transport depots, bus stations, oil installations and hospitals. Children were found to be up to 12 times more likely to die from cancer if they lived near a pollution hotspot.

“

We've got a lot of rebuilding to do. First, we're going to save lives and stabilize the situation. And then we're going to help these communities rebuild. The good news is – and it's hard for some to see it now – that out of this chaos is going to come a fantastic Gulf Coast, like it was before. Out of the rubble of Trent Lott's house – he's lost his entire house – there's going to be a fantastic house. And I'm looking forward to sitting on the porch. (Laughter)

George W. Bush, touring hurricane damage in New Orleans.

”

IRAQ GETS REALITY TV

It had to happen. After years of living under the despotic regime of Saddam Hussein, freedom has come to Iraq in the form of makeover television. The catchily titled *Labour and Materials* is a new weekly, 15 minute TV series in which a cast and crew descend unannounced on the bombed out house of a lucky resident of Baghdad... and rebuild it over the course of the next six episodes. And as everyone in Britain knows, one reality TV show is never enough. Iraq has also got its own version of *Pop Idol* called *Iraq Star*. Despite 2,000 people signing up to audition, however, few of them are women, discouraged by fear of the increasingly conservative mood in the country.

56

BILLION POUNDS

The projected current cost of cleaning up over 50 years of nuclear waste from UK power stations and military projects, a number that Sir Anthony Cleaver, chair of the Nuclear Decommissioning Authority, has said will rise further.

PHOTOGRAPH BY PRESS ASSOCIATION

“

In the poorest country of the world, which is still recovering from a decade-long bitter civil war, DfID [Department for International Development] is not only going to pay international consultants to advise on how to privatise water ... but they will also pay for a propaganda campaign to run alongside it to counter public resistance.

Vicky Cann, of the World Development Movement, on the UK government's plans to privatise water services in Sierra Leone.

”

**ORGANIC FARMING BEST FOR BIRDS (AND BATS AND BEES AND PLANTS)**

There are 109 per cent more wild plants and 85 per cent more plant species on organic farms than on non-organic farms, according to a new study by the British Trust for Ornithology. Furthermore, organic farms support 32 per cent more birds and 35 per cent more bats according to the study, funded by the Government's own Department for Environment, Food and Rural Affairs. Commenting on the findings, Gundula Azeez, the policy manager for organic body The Soil Association, said: 'A greater area of organically-managed land in the UK would help restore the farmland wildlife that has been lost from our countryside in recent decades with intensive farming.' Currently just three per cent of UK farmland is farmed organically, despite ever-growing support for organic food amongst the UK public.

**HUMANITY BEHIND BARS**

Five women and three men on display at London Zoo as part of an effort by the Zoological Society of London to highlight humanity's role as a 'plague species' driving thousands of other species toward extinction.



FOR PEAT'S SAKE

An expanse of frozen Siberian peat bog the size of Germany and France combined is melting as a result of global warming, with potentially devastating consequences. The million square-mile expanse of western Siberian is the world's largest peat bog and froze over around 11,000 years ago. Underneath the permafrost are trapped billions of tons of methane, a greenhouse gas 20 times more powerful than CO₂. Were the permafrost to melt, say scientists, it could singularly cause global climate change to pass a 'tipping point'. Even if the methane were just to escape slowly from the bog over the next 100 years, it would contribute a further 700 million tonnes of carbon into the atmosphere annually, around the same volume released each year from the world's wetlands and, as a result of farming practices, exacerbating the impact of climate change worldwide by 10-25 per cent. Temperatures are rising in Western Siberia faster than anywhere else on the planet, with rises of over 3°C witnessed over the last 40 years. Just four years ago the whole expanse was frozen. Scientists now report seeing mud and lakes, some as large as half a mile across. 'This is an ecological landslide that is probably irreversible and is undoubtedly connected to climatic warming,' said Russian scientist Sergei Kirpotin.

GM MILK ANYONE?

Marks & Spencer is the only supermarket in the UK to have committed not to sell milk from cows fed on GM-feed. Despite the fact that most people in the UK reject genetic modification, the supermarkets do not make their customers aware that the milk they buy may have come from cows fed on GM feed.



“The atmosphere almost looks like an eggshell on an egg, it's so very thin. We know that we don't have much air, we need to protect what we have.”

Nasa astronaut Eileen Collins comments on the view of earth from space.

15

THOUSAND DOLLARS

The price of a two-year-old giraffe found for sale on an internet trading site by the International Fund for Animal Welfare. The giraffe was one of nearly 9,000 wildlife products for sale in one week on English-language websites alone, with more than 70 per cent of them being from species protected under international law. Other animals for sale included a Siberian tiger and four baby chimpanzees.



In response to the Government's newly introduced law banning protests such as this one in Parliament Square, a host of ways to mock and contravene the ban have sprung up. Most involve various forms of peacefully picnicking in the square (perhaps whilst making protest banners) although other suggestions have involved 'demonstrating' the use of various products to one's friends and associates, while standing in front of the seat of UK government. To find out more or get involved go to www.parliamentprotest.org.uk

NON-STICK BABIES?



Babies in the womb are being contaminated with hazardous non-stick chemicals, flame-retardants, perfumes and other gender-bending chemicals, a new report by WWF-UK and Greenpeace has found.

Tests on blood taken from the umbilical cords of nearly 30 new-born babies and from more than 40 new mothers were analysed for the presence of eight groups of chemicals, ranging from artificial musks used in cosmetics and cleaning products to flame retardants and chemicals used to make plastics and non stick and water-proof coatings.

Every single sample of mother or baby blood tested positive for a host of chemicals, many of which are suspected of links to health problems ranging from birth defects and genital abnormalities to certain types of cancer. All umbilical cords contained a minimum of five of the 35 chemicals tested for, some contained as many as 14. Two of the mothers tested had 17 of the 35 chemicals in their blood.

For more information: <http://www.greenpeace.org/toxics>

116,000

HECTARES

The area of Europe's Mediterranean coast estimated by the European Space Agency's Desert Watch project to be threatened by desertification due to global warming.

“

If you ask them, do you want to go back to the ocean, you know what they would say, “Are you crazy?”

American DIY billionaire Bernard Marcus, who has just built the world's largest aquarium, on how the newly-housed two adolescent whale sharks (who will grow to be 40ft long) would reply if asked if they prefer the aquarium to the sea.

”



GM GIANT BIDS TO OWN THE WORLD'S FOOD

In the same week that researchers from the International Rice Genome Sequencing Project (IRGSP) completed a sequence of the rice genome – the first crop plant to be sequenced – GM giant Syngenta filed 15 global patent applications to give the company control over them. In essence the company is claiming it invented over 30,000 gene sequences of rice. If the corporation's application succeeds countries across the world will lose control over one of the grains that has been the basis for their diets for millennia. Speaking in India, Dr Devinder Sharma, chairperson of the New Delhi-based Forum for Biotechnology & Food Security, said it would be: ‘the beginning of a scientific apartheid, not only against India but for all third world countries,’ adding, ‘in other words, biological inheritance of the world's major food crop is now in the hands of a Swiss multinational.’

Furthermore, the company is also applying for patents on most of the other major crops in the world, ranging from wheat, corn, and rye to banana and soya beans. According to Syngenta, it has the right to do so because it claims the gene sequences are identical in these other crops as to those in rice. The implications of these moves are that they would basically allow the company to set the price for anyone wishing to use seeds on any of the above crops (and many more). According to Tina Goethe from environmental organisation Swissaid: ‘With these patents Syngenta is claiming the work of breeders and farmers from the past centuries as the company's own invention. The attempt to monopolise thousands of gene sequences from the most important crop plants in one rush is nothing less than a theft of common goods.’ Ironically, 2005 has been the UN Year of Rice.

THE FLU VACCINE... A SHOT IN THE DARK?

If we truly knew about flu, and the lack of effectiveness of the vaccine being offered as protection, would we really be so obedient about getting the jab? BY PAT THOMAS



It's flu season again. The posters are up in the clinics, your GP has a stack of NHS information leaflets and advertisements and articles are appearing in the media carrying the health authority message that it's time to get vaccinated.

Stirring up fear and apprehension through association is not a new tactic, but among the more troubling aspects of this message is the way that promoting a vaccine for flu places influenza on a par with more devastating diseases such as smallpox and diphtheria. Nevertheless the scare tactics have worked. Flu vaccine uptake among the over 65s, for example, has risen for each of the last three years from 65, to 68 and now 69 per cent against the government target of 70 per cent set three years ago.

The catch phrase on this year's NHS information leaflet is: 'If you knew about the flu you'd get the jab'. But if people truly knew about flu, and the lack of effectiveness of the vaccine being offered as protection, would they really be so obedient about getting the jab?

How deadly is the flu?

According to the UK Department of Health (DOH), 3,000 to 4,000

excess deaths are attributable to flu in non-epidemic years. During epidemics this figure rises; in 1989-90 there were apparently 30,000 excess deaths in Great Britain attributable to flu. The new DOH 'factsheet' *Influenza: The Disease and The Vaccine* goes further, estimating that an additional 12,500 people die each year during the flu season in England and Wales. In the US, the Centers for Disease Control and Prevention (CDC) website notes that, on average, 36,000 people die each year from flu in the US.

Contrast these figures with those from the Office for National Statistics, which show that in 2004 only 33 people died of influenza in England and Wales, and the CDC's own data showing that in 2002 just 753 people died from flu and in 2001 only 257.

The discrepancy between actual deaths and those reported in 'factsheets' arises from the practice of combining flu deaths with a percentage of those from pneumonia and other respiratory diseases, making flu appear more deadly than it is.

The most recent CDC National Vital Statistics Report, for example, lists influenza and pneumonia as the seventh leading cause of death in 2002. Break down the figures and you find that only 753 of those deaths were flu-associated, while 65,321 were pneumonia-associated. If all flu-associated deaths are removed, pneumonia-associated deaths would still rank number 7, but influenza would barely register on the medical radar.

The whole truth?

In the UK, total flu deaths are also the result of combining influenza and pneumonia deaths, but the DOH's

influenza factsheet goes further combining data on flu, pneumonia and bronchitis, to paint its dramatic picture of flu-related mortality. In small print it acknowledges: 'It is difficult to establish how many people are seriously affected by flu each year as hospital admissions and deaths may be due to complications or the infection making other illnesses worse.'

In other words they are guessing and it is the laziest kind of guesswork since the winter season can bring about a whole range of health complications, including higher cholesterol levels and worsening glucose control, which have nothing at all to do with viruses. In fact, according to a 2002 report published in the *British Medical Journal* in which British scientists tracked the causes of excess winter deaths over the preceding 10 years, flu accounted for less than three per cent of all excess winter deaths in the UK (a higher figure than in other developed countries). In this country 'cold stress' – lack of adequate heating indoors and lack of appropriate winter clothing when outdoors – was the bigger killer.

Health professionals justify combining flu deaths with pneumonia deaths by insisting that 'influenza leads to pneumonia', but the facts don't generally support this. The American Lung Association, for instance, acknowledges over 30 different causes of pneumonia (one of which is influenza). A single bacterium – *Streptococcus pneumoniae* – is responsible for up to 50 per cent of all cases of pneumonia. Pneumonia is also caused by other bacteria such as *Staphylococcus aureus*, *Pertussis* (whooping cough), *Streptococci*, and *Mycoplasma pneumoniae* (a common cause of walking pneumonia). There are also many non-infectious causes of pneumonia such as asthma, aspiration of fluids, toxic exposures and immunodeficiency.

Neither the CDC nor the DOH track the specific causes of the pneumonias that result in death. What is clear, however is that influenza is not the major cause of pneumonia and not a major cause of death. What has also become clear is that the flu vaccination does not prevent death.

Earlier this year a report in the medical journal *Archives of Internal*

Flu jab →

KEEP YOUR GUARD UP AGAINST FLU

Flu isn't like the common cold. It can put you in hospital or even kill.

GPs recommend the flu jab. It works and it's free to anyone aged 65 years and over or those in at risk groups*. Book an appointment with your local surgery. Don't let your jab go to waste!

*Those at risk include people with a chest or heart condition, kidney failure, diabetes or any other serious medical condition.

For more information either call NHS Direct on 0845 4647 or visit www.nhsdirect.nhs.uk

GET THE RIGHT TREATMENT. NHS

Medicine dropped a bombshell: although immunization rates in the elderly (people over 65) have increased 50 per cent in the past 20 years, there has not been a concurrent decline in flu-related deaths.

Another year, another vaccine

Vaccines are the sacred cows of medicine, you can't question their effectiveness or publicise their adverse effects without sustaining a volley of criticism from the medical orthodoxy. Nevertheless we should be sceptical of their necessity and effectiveness, especially for seasonal, self-limiting illnesses like the flu.

There are three types of flu virus – types A, B and C. Influenza A occurs more frequently, is the most virulent and is responsible for most major epidemics and pandemics. Influenza B often co-circulates with influenza A during the yearly outbreaks, but generally causes less severe illness. Influenza C usually only causes a mild or asymptomatic infection similar to the common cold.

Within each of these types there are many different strains of influenza virus. While some are more common than others, there are literally hundreds of flu viruses that can be circulating at any one time. Nevertheless, every February the scientists at the World Health Organization meet to try and divine the three that are likely to cause the most misery the following winter. The viruses they choose – two type As and one type B, say – are then included in that year's vaccine.

Problematically, in the several months between formulating the vaccine and

FLU VACCINE ROULETTE

This year's vaccine contains two viruses from last year's vaccine: type A/New Caledonia/20/99 (H1N1)-like strain and type B/Shanghai/361/2002-like strain. It also contains one new virus: type A/California/7/2004 (H3N2)-like strain.

Like all flu vaccines it is made from inactivated parts of these viruses. These virus parts correspond to parts of proteins floating around in your body. When the virus latches onto a matching protein, it stimulates the body to produce antibodies that help to destroy the corresponding virus. The catch is that a flu vaccine can only stimulate your immune system to protect you against the viruses in the vaccine, with some lesser protection against very similar viruses. If you are exposed to a different virus or to a mutated form of the same virus, the vaccine won't keep you from getting sick.

While health authorities tend to classify the very young and very old as the most vulnerable to flu, age *per se* is not a reliable indication of risk. Social status matters much more

administering it, the viruses – which are naturally constantly evolving and mutating – may have changed, or new ones may have emerged.

Maybe you will be infected with the virus that matches the vaccine, but then again maybe you won't; flu 'experts' often get it wrong. For example, in 1994 they predicted that Shangdong, Texas, and Panama strains would be prevalent that year, thus millions of people were vaccinated against these viruses. However, when winter arrived, it was the Johannesburg and Beijing strains that circulated through society. It was a similar story in 1996, 1997 and most recently, in 2003 when the vaccine was made from flu strains that were uncommon that season.

No Protection

While the flu vaccine is vigorously promoted by health agencies as the 'best' protection against flu, proclamations of how many people didn't get flu thanks to vaccination are little more than fantasy; there is no truly reliable way to tell who would or would not have contracted the disease. What is more, studies into the efficacy of the vaccine continually show mixed results.

Health authorities justify the yearly vaccine campaign with data showing that when the match between the vaccine and circulating viruses is close, the flu vaccine provides a 70-90 per cent chance of temporary immunity in healthy

persons under 65 years of age – a bizarre justification for the effectiveness of the jab given that healthy people don't need the vaccine and are not among those targeted by government campaigns.

At any rate, reviews of the benefits of the flu vaccine in otherwise healthy adults show these figures to be overstated. While vaccinating healthy individuals temporarily reduces the number of people carrying the virus, it does not reduce the number people who ultimately go on to develop flu.

Recently doctors at the prestigious Cochrane Collaboration, a respected international organisation that conducts and publishes systematic reviews into the effectiveness of medical treatments, set out to find the answer to a simple question: how effective are flu vaccines for healthy people under the age of 60? They reviewed 25 good quality clinical trials, published in medical journals between 1969 and 2002, in which healthy people between the ages of 14 and 60 years had been randomly given either an actual or placebo vaccine. Their conclusion? Only six per cent fewer vaccinated people got flu, compared to the unvaccinated people. In addition, the influenza vaccine did not reduce the number of working days lost, nor did it reduce the incidence of flu-related complications, deaths or hospitalisations.

In at-risk groups, such as those aged over 65, official figures tell us that the effectiveness rate is dramatically lower than for healthy individuals, around 30-40 per cent. To put this into context most placebos, if enthusiastically promoted by a physician, will work 30-70 per cent of the time.

And even if the vaccine contains the 'right' strains, not everyone responds to it by producing antibodies (see box on page 18). As many as 40 per cent of people over age 65, for example, do not respond to the vaccination.

Declarations of how many vulnerable people didn't get flu thanks to vaccination are also little more than fantasy, based on 'after the event' data collection. The only reliable way to tell who would or would not have contracted the disease is to track illness rates among vulnerable people during the flu season. Last year, for the first time ever, that is what the US federal



government did. The CDC-funded study followed health care workers in Colorado, where the 2003-04 flu season started with a vengeance. Results showed that virtually the same percentage of people suffered from influenza-like illness whether they were vaccinated or not, and that the vaccine 'was not effective or had very low effectiveness' against flu-like illness.

The results of these and other recent studies have dealt a serious blow to vaccine proponents.

Hidden ingredients

Apart from its low effectiveness against constantly evolving viruses, there is also concern over the various ingredients of the flu vaccine. Most vaccines are grown on animal tissues. The flu vaccine is grown in chicken eggs, which makes it unacceptable for vegans and those with egg allergies.

Flu vaccines can also contain some alarming 'inert', or inactive ingredients. The formulation varies between manufacturers but can include preservatives such as aluminium hydroxide, associated with Alzheimer's disease and seizures, thimerosal – a mercury-based neurotoxin, and phenol, which is a human carcinogen. Antibiotics such as neomycin, streptomycin and gentamycin sulphate are also sometimes included as preservatives.

Vaccines can contain traces of the chemicals used to inactivate the viruses including formaldehyde – a known carcinogen. The flu vaccine can also contain a range of stabilisers including the neurotoxin monosodium glutamate (MSG), potassium phosphate, sucrose and sorbitol.

For this reason opponents of the vaccine say that, for most people, the flu shot does not protect, but instead weakens the immune system making the recipient more vulnerable to illness. The same people who are being targeted for the jab, the elderly, the very young and the immune compromised, are those least able to withstand such a systemic chemical assault.

For some people the adverse effects of the jab – fever, fatigue, painful joints and headache – can be more intense than suffering through a week or so of flu. In some patients the flu vaccine can be a

trigger for asthma attacks. Optic neuritis and permanent blindness, vasculitis and joint problems are other rare, but well-documented adverse effects.

However it is Guillain-Barre Syndrome – a devastating immune-mediated nerve disorder characterised by muscle weakness, numbness, pain and paralysis – that remains the most serious reported reaction to a flu vaccine, and this usually occurs within two weeks of vaccination. The risk appears to vary from year to year, though globally the vaccine accounts for hundreds of cases each year. One possible cause is that flu vaccine contains the disease trigger *Campylobacter jejuni*, a bacterium found in 40-50 per cent of chickens eggs.

Cultural cure-all

The shortsighted health authority strategy for winter wellness involves improving 'herd immunity' – vaccinate the majority to lower the risk for a minority. US health authorities are currently considering implementing universal flu immunization for all Americans, and the UK can't be far behind in this thinking. But widening flu vaccination programmes to include healthy people will not protect the most vulnerable because exposure to a virus is only a small part of why we succumb to flu.

Logically if exposure was the only factor, each of us would get sick every time we were exposed to a flu virus, yet this is not the case. To understand why some people are more vulnerable to flu than others we need to address the bigger picture of what makes us ill and stop relying on crude calculations of who is most at risk.

While health authorities tend to classify the very young and very old as being the most vulnerable to flu, *age per se* is not a reliable indication of risk. Social status is much more influential.

In a supposedly classless society this is a contentious assertion. But medical

research consistently shows that adults and children of lower socioeconomic status are at higher risk for a wide range of communicable infectious diseases, especially respiratory infections, and their complications.

In the absence of education, improved living standards and better hygiene, employing a vaccine as protection is like spitting on a raging fire

With regard to flu, this concept has a certain amount of historical precedence. While many authorities promote the idea that the 1918 flu pandemic, which killed around 30 million people worldwide, was an egalitarian disease, a closer look at the

data says otherwise.

According to a summary published in the *British Medical Journal* in 2000, data from the 1918 pandemic showed a striking impact in areas such as sub-Saharan Africa and India, where the death rate was 30 per 100,000 population, compared with five per 100,000 in Europe and North America. The estimated 20 million deaths in India were among those living in poor, crowded and starving conditions. In Europe, the epidemic was more devastating than usual because of the poverty, the run-down immune systems and poor nutritional health of both military and civilian populations following the deprivations of the First World War.

This year the UK Government has tacitly acknowledged the special vulnerability of disadvantaged individuals through its special efforts to target people from black and minority ethnic communities – statistically those most likely to be living in poverty.

People living in poverty face many unique health challenges. Often they live in substandard or crowded housing, with inadequate heating, damp and mould. They are frequently ignorant of basic hygiene measures – such as regular and thorough washing of hands – that can stop the spread of viruses. They may be stressed physically and emotionally, their bodies overloaded with environmental toxins such as heavy metals (ie lead from old paint) and subsisting on a

FLU VACCINE

nutritionally poor diet. Children from low-income families are also less likely to have been breastfed, and thus are denied an essential foundation for a healthy immune system.

Wanting to protect the vulnerable is commendable. But in the absence of education, improved living standards and better hygiene, employing a vaccine as protection is like spitting on a raging fire. Yet in a recent consultation document entitled *Making Markets for Vaccines – A Practical Plan*, produced by the Center for Global Development (CGD), an independent think tank that conducts research and analysis into global poverty and inequality, the very first line says: ‘Vaccines are a very effective way to tackle poverty’. It goes on to say: ‘As well as preventing death and illness, immunization also contributes to greater attendance in school, increased productivity, enhanced lifetime earnings and economic growth.’

Read that again and ask yourself if you still believe that vaccines aren't being aggressively marketed as cures for social problems. The vaccine as a panacea remains the unshakeable mindset of the medical community. While the CGD report focuses on spreading the vaccine gospel to the developing world, its ethos can be seen in the developed world as well where vaccines are endorsed as a remedy for so many things that are too complicated (better hygiene, encouragement to breastfeed) or too expensive (winter-proof housing, higher benefit rates) for the government to fix.

Throwing pharmaceutical solutions at social problems never works and is ultimately more damaging to human health and well-being. Nevertheless, encouragement from government and publicity from an acquiescent media means that Big Pharma is currently rubbing its hands with glee. As drugs like Vioxx take big hits in the court and the adverse effects of popular magic bullets such as HRT, Prozac and Ritalin shake people's faith in drug solutions to common health problems, revenues from vaccines and other panacea drugs are helping to keep drug companies in the black.

Flu vaccines generated about one billion dollars in worldwide sales last year,

COMMON SENSING THE FLU

If you do succumb to flu, two antiviral drugs zanamivir (Relenza) and oseltamivir (Tamiflu) are currently being promoted as the best way to fight back. Taken within a day or two of the onset of symptoms these drugs are supposed to lessen the duration of the flu and reduce debilitating symptoms. In addition, Tamiflu is currently being touted as effective prevention for all types of flu including bird flu (though given that bird flu is exceptionally rare in humans, it's tempting to ask where the supportive data for this claim comes from).

Unfortunately medical research shows that at best, both drugs provide about a one-day reduction in influenza symptom duration. What is more, there will be pressure for high risk individuals to take drugs like Tamiflu for weeks on end to the exclusion of simpler methods of prevention, and the safety and efficacy of these remedies in individuals at high risk of pulmonary disease, such as pneumonia, has not been established. Fortunately other methods of protection may be just as effective without the risk of adverse effects.

In a perfect world healthy people would recognise that the best protection against a new virus is a successful, managed encounter with the real thing. Rather than trying to avoid flu, consider simple common sense measures to keep virus populations to a minimum while boosting your own immunity:

■ **Wash your hands.** Hands are the main vehicles for transmitting viruses from person to person. Wash thoroughly and frequently during the day, especially after going to the toilet or before preparing food.

■ **Eat well.** Winter diets can be low in essential nutrients like Vitamins C and A. Go out of your way to include fresh, deeply coloured vegetables in your daily diet such as spinach, broccoli, tomatoes and peppers. Avoid foods that destroy these nutrients such as sugar, caffeine, and trans fats.

■ **Exercise.** Regular moderate exercise improves immune function and reduces susceptibility to cold and flu. If you can take exercise in the open air, rather than in enclosed potentially germ-ridden environments, so much the better.

■ **Watch your stress levels.** The ability of stress to depress immune function and to precipitate and aggravate infectious diseases is widely recognised in medicine and some physicians believe that stress may be the single biggest risk factor for flu. Research shows that it is not just the stress of work and family that are influential – the stress of being lonely and disconnected from your social group is equally devastating to immunity.

and the market is expected to double by 2007. In the future, for companies like Aventis Pasteur, Chiron and GlaxoSmithKline, Christmas will come in October and last well into April.

We are currently in the grip of an organised attempt to keep us fearful of even the most innocuous illnesses and, as a result, keep us consuming drugs that do no good whatsoever. The government misinformation campaign and the yearly media circus that surrounds the influenza vaccine is a good illustration of this.

Thankfully the flu vaccine is not (yet) compulsory. People have the choice to

either choose or refuse it. The question is: Now that you know more about flu, and the flu vaccine – *will you be getting a jab?*

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Dear Dr. Tatiana

I'm a burying beetle. I met my wife when we worked together at a chipmunk's funeral. It was love at first sight, and after a whirlwind romance I thought I'd found paradise. But now she's turned into a frightful harridan. Nag, nag, nag. I don't get a moment's peace, and whenever I try to relax in the evening by doing headstands, she bites me or knocks me over. What have I done to deserve this, and how can I get her off my back? 'I Hate the Trouble and Strife', Ontario



Dear 'I hate the Trouble and Strife',

Are you sure you're not trying to have your corpse and eat it too? You know as well as I do that when a male burying beetle stands on his head he exposes the tip of his abdomen and sends sexy scents wafting through the air. I suspect that when you do your headstands you're not chilling out, but trying to attract a mistress. Call it a hunch, but that might be why your wife finds your behaviour so galling.

Look at it from her point of view. The two of you must have struggled for hours to bury that chipmunk – they are more than two hundred times heavier than you are. If you were lucky, the body was lying on soft earth so all you had to do was dig the soil out from underneath it. But if the ground was hard, you would have had to move the corpse, perhaps over the astonishingly long distance of several metres, to soft ground. Once the body was interred and out of reach of ants and blowflies, you had to remove its fur and massage its poor dead flesh into a ball, ready to feed to your babies when they hatch and crawl onto the carcass. Lucky babies! Nothing like regurgitated rotting chipmunk to give you the start you need!

But now you and your headstands are threatening this blissful scene. Sure, a mistress would be great for you – you'd have more children if you could lure a second female to the carcass, but it would be a disaster for your wife. The presence of another woman and her brats would make it harder for your wife to raise her own. This is not just because the two families would have to share the chipmunk meat and there might not be enough to go around. Instead, your mistress would probably murder (and then eat) some of your wife's children.

Charm offensive

Rather than raging when they feel insecure, some females mount a charm offensive. Female starlings, for example, get all lovey-dovey and constantly beg for sex if they notice their mate courting other lasses. But whether they shower their mate with kisses or brickbats, females everywhere have the same response to girls they suspect of seducing their husbands: hostility. In the northern harrier, a bird of prey from North

America, females intimidate possible rivals and attack them if they are carrying food. Female blue tits dive-bomb their rivals, often knocking them out of the air. A female starling, as well as distracting her mate with canoodling, will chase a rival whenever she spots one hanging about and will sing ostentatiously to show the little tart what's what. If she finds her mate strutting his stuff at a second good nest hole, she may resort to filling it up with straw, feathers, and other material to make it look occupied, even though she has a nest of her own. A male starling often ends up chasing his wife back to her own nest to stop her beating up potential mistresses.

But he doesn't have it as bad as Mr *Lamprologus ocellatus*. This fish lives in Lake Tanganyika, one of the Great Lakes of tropical Africa. A male holds a territory; as for many birds, a crucial feature of his territory is the nest sites he can offer – in this case, empty snail shells. You might not think so, but there's fierce competition for these pre-owned shells. Many creatures find them useful shelters. Hermit crabs famously depend on finding used snail shells: rather than growing shells of their own, they move from empty shell to empty shell as they get bigger. It's not always easy to find a shell the right size, yet many hermit crabs are finicky, preferring to squeeze into shells that are too small rather than wear a shell of the right size that has a hole in it. And just to show how central used snail shells can be to a local community, some hydroids – simple animals that are related to jellyfish, corals, and sea anemones – prefer to settle on shells occupied by hermit crabs. How can they tell? Hermit crabs scuttle about faster than the shell's original owner, and baby hydroids are attracted by the motion, so it's mutually convenient. Hydroids have powerful venoms that might discourage anyone in the mood for a hermit-crab sandwich. For the same reason, some hermit crabs harvest sea anemones and stick them to their shells. In return, the hydroid (or anemone) gets scraps of food and protection from its own predators, which the crab zealously fends off.

Shells for hire

In Lake Tanganyika, at least 15 species



Hermit crabs are finicky, preferring to squeeze into shells that are too small rather than wear a shell of the right size that has a hole in it.

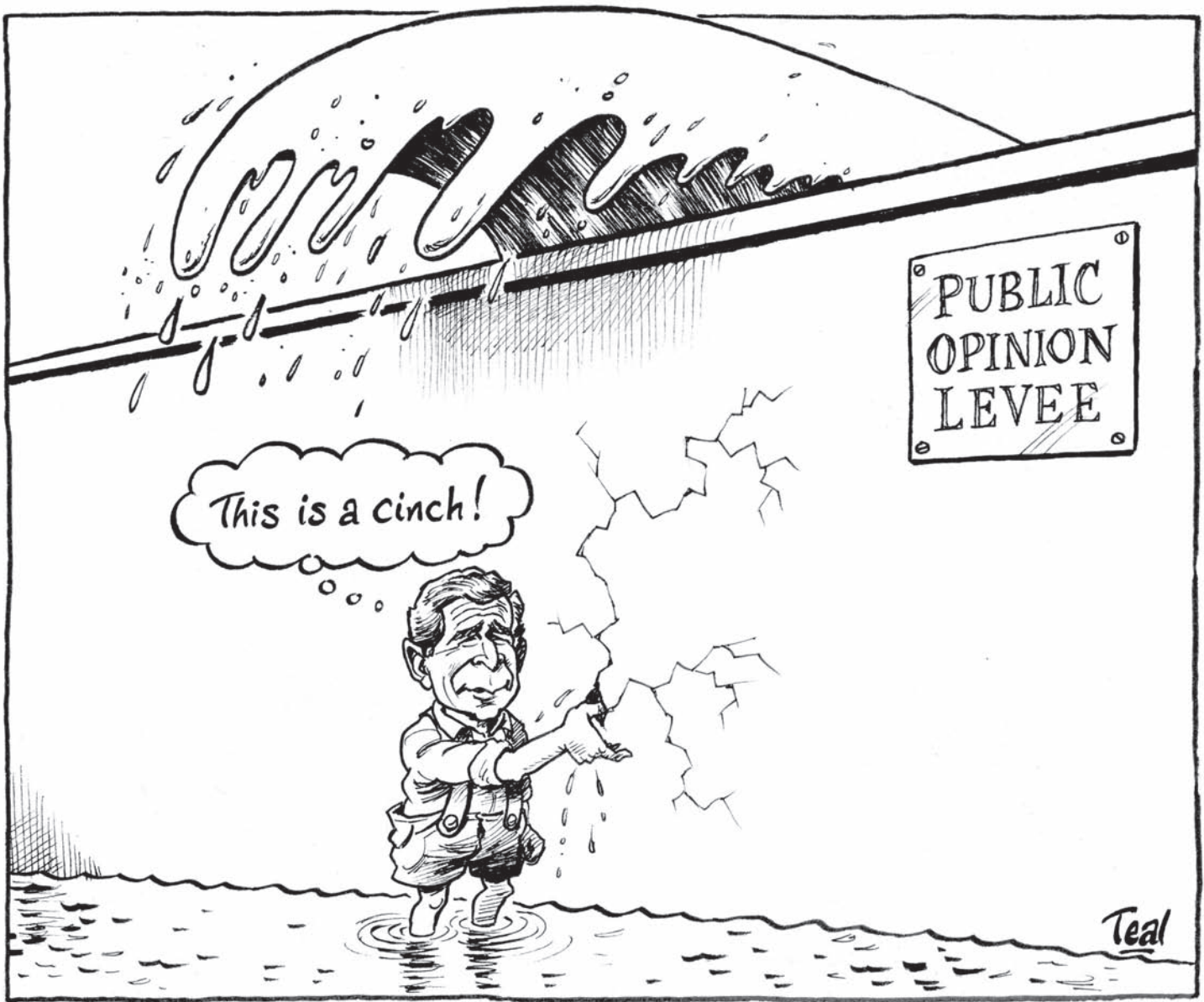
of fish want second-hand snail shells in which to lay their eggs. As the males of most species are unable to move the shells any distance, they have to make do with whatever they find in the vicinity. But in one species, *Lamprologus callipterus*, males can grow to 11 centimetres (four inches) and can easily nip shells with their mouths and carry them back to their territories. (This species may hold the record for males towering over females: females are less than half as long and 14 times lighter. They can't grow big because they have to fit inside the shells.) The biggest males hoard shells for females to spawn in. As usual, they have no scruples about where they come from and often steal from one another. So perhaps it's not surprising that the smaller *Lamprologus ocellatus* male, who can only move a shell by pushing it, buries any shells on his territory before swimming about and looking pretty as he waits for females to arrive.

If a girl stops by and they take a shine to one another, he digs up a shell and she takes up residence until she's ready to spawn. (If she fails to spawn within a few days, the male kicks her out – what does she think this is, a homeless shelter?) When she does spawn, she lays her eggs in the shell, gluing them to the inside. He then fertilises them, and she stays in the shell fanning the eggs to keep them aired and clean. Once the brood hatches, she and her little ones live in the shell until

the young are old enough to go out into the world. Female *Lamprologus ocellatus* hate one another. Whoever moves in first does her best to remain in solitary splendour, chasing away all visiting females and otherwise terrorising them. If a second female decides to settle in the territory anyway, she'll have to live in a shell far away from her rival's – and even then she'll face constant harassment. The male is continually breaking up fights and chasing the aggressor back to her shell; since a pair of females attack each other several times an hour, the peace process takes a lot of his time. It's vital, though. Unsupervised, the females would go on fighting until one of them moved out. So, boys, if you're thinking of cavorting with more than one girl, remember the Chinese symbol for peace. It's one woman under a roof.



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 SUPERDOME: MONUMENT TO A ROTTEN SYSTEM

People in the US deserve better than living under a system that weeps over spilled oil and rolls its eyes at our spilled blood **BY DAVID ZIRIN**

There is nothing 'unnatural' about the disaster of New Orleans. When politicians smirk at global warming, when developers look at our wetlands and dream of mini malls, when billions are flushed in the name of war and tax-cuts, when issues of poverty and racism don't even register in Presidential debates, all it takes is wind – albeit 145 mph wind – to expose a sturdy superpower as a house of cards. Nowhere is this exemplified

more painfully than in a monument to corporate greed that has rapidly become the earth's most damnable homeless shelter, the Louisiana Superdome.

The Superdome is perhaps the most unintentionally appropriate name since Mr and Mrs Cheney looked at their newborn son and said, 'Dick'. It was birthed in 1975 with pomp and bombast, as the largest domed facility in the world. It was also funded entirely on the public

dime. In a case of brutal foreshadowing that would shame a B horror flick, the dome was constructed on an old cemetery for the poor. The burial grounds were dug up and discarded with a promise that the Superdome would be the centrepiece of a New Orleans 'Central Business District' that would benefit all.

The results are certainly now in plain, ugly view. In one week this August, 25,000 people walked through its doors,

ILLUSTRATION BY ADRIAN TEAL

many for the first time. They entered a stadium where tickets go for 90 bucks a pop, season passes cost \$1,300 and luxury boxes can run for as much as \$109,000. The arena boasts of having a capacity that can comfortably seat 72,000 people, with 9,000 tons of air conditioning, and 88 massive restrooms. But for the 25,000 who can't afford the oxygen, there has been no air conditioning and the bathrooms have had no electricity, running water, or working toilets. Faeces and garbage now pack the upper decks. The traumatized people finally emerged to tell of dead bodies on the 50-yard line. One man even committed suicide, throwing himself off the upper deck. When asked if it could hold the storm or the flood, Democratic Governor Kathleen Blanco called the Superdome shelter strategy an 'experiment'.

Saints' receiver Joe Horn has looked at the place where he has set receiving records and said that football couldn't be farther from his mind. 'It's devastating to us. I've cried three or four times. Seeing kids without any food, elderly people dying and the government saying that help is on the way – that's the most shocking part.'

He's right. That is the most shocking part. Leading this carnival of disgrace is 'Mr Shock and Awe' himself, George W Bush. Everyday, President Bush doles out comments that signal his removal from any basic notion of humanity. Perhaps the most galling: 'The good news is – and it's hard for some to see it now – that out of this chaos is going to come a fantastic Gulf Coast, like it was before. Out of the rubbles of Trent Lott's house – he's lost his entire house – there's going to be a fantastic house. And I'm looking forward to sitting on the porch.'

But happy visions of mint juleps with Trent, while Mamie and Prissy tighten Scarlett's corset, just will not sell. The discussion instead, from right wing editorial pages in New Hampshire and Mississippi to an vocal, angry, Civil Rights community, is about the racism, profiteering and vile hypocrisy at the heart of this system.

As Norman Solomon wrote: 'The policies are matters of priorities. And the priorities of the Bush White House are clear. For killing in Iraq, they spare no

expense. For protecting and sustaining life, the cupboards go bare. The problem is not incompetence. It's inhumanity, cruelty and greed.'

Frederick Douglass said it even better a century ago in his speech, 'What to the Slave is the 4th of July?'

'[Y]our national greatness, swelling vanity; your denunciation of tyrants, brass-fronted impudence; your shouts of liberty and equality, hollow mockery; your prayers and hymns, your sermons and thanksgivings, with all your religious parade and solemnity, are, to Him, mere bombast, fraud, deception, impiety, and

hypocrisy – a thin veil to cover up crimes which would disgrace a nation of savages.'

I would amend the great Mr Douglass just to say that we are not at present a nation of savages. The unreal outpouring of both aid and the furious call for answers are not the actions of beasts. But it is now clear that savages rule our lives. The echoing cry from the Gulf Coast is that we deserve better than living under a system that weeps over spilled oil, and rolls its eyes at our spilled blood.

■ Dave Zirin writes a blog at www.edgeofsports.com

MARKET FAMINES

The millions of people in Niger who died during the recent famines, did so because the IMF pressured its government to tax food and the poor simply couldn't afford to save themselves. **YVES ENGLER** REPORTS

Starving children get media attention, well-fed imperial economists don't. Yet modern history shows they are usually two sides of the famine coin.

Over the past month thousands have died of starvation in Niger, but all the while food has been available. The poor simply don't have the money to pay rising food costs, so they starve.

In the spring the International Monetary Fund pressured Niger's President Mamadou Tandja to implement a 19 per cent value added tax with foodstuffs included. The tax was added even though food costs rose more than 75 per cent in the previous five years. Concurrently the main income of country's nomadic – livestock – fell a quarter in value, leaving the poor with less money to purchase basic foods.

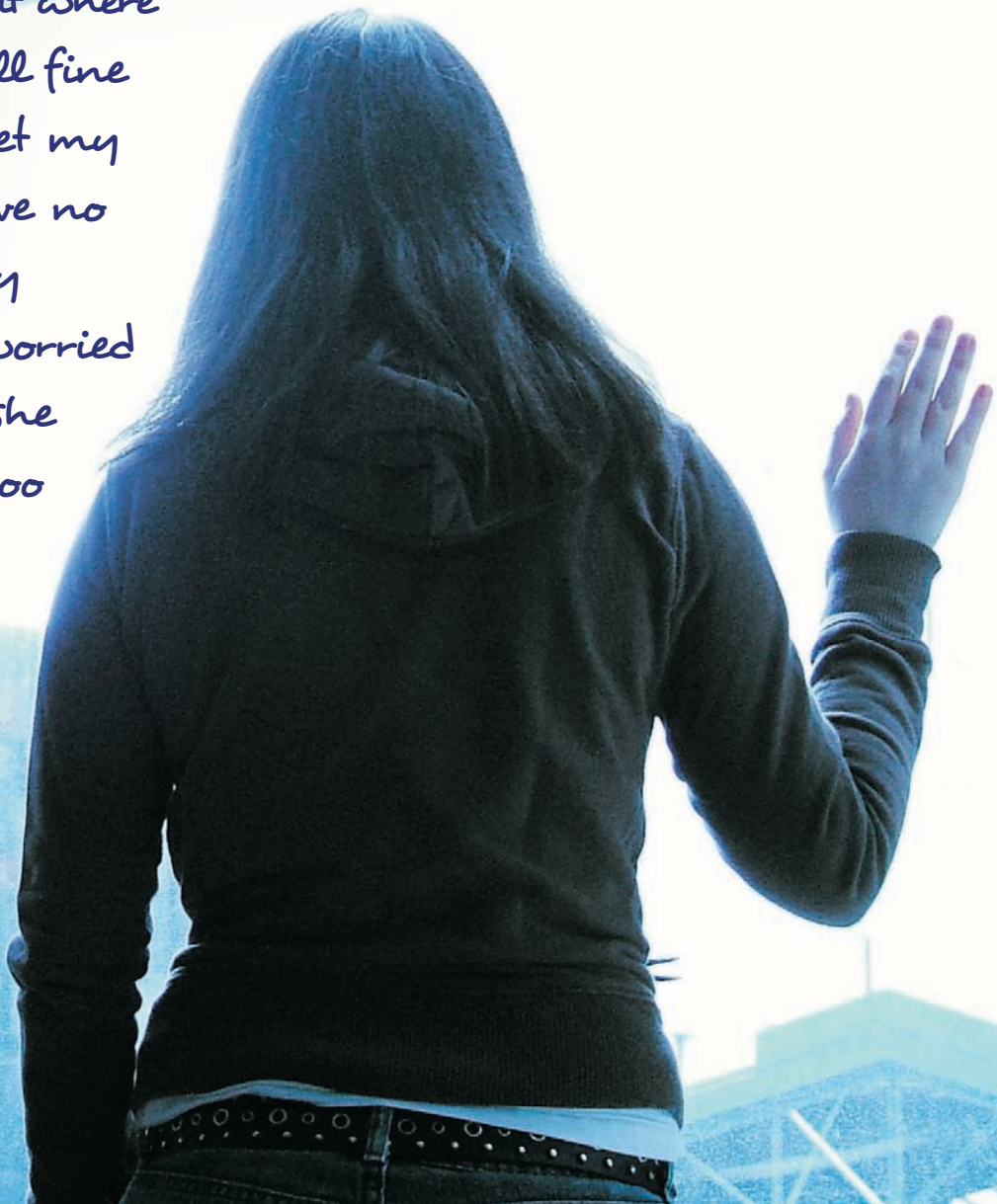
When international groups began drawing attention to the worsening food crisis, the interests of the 'market' were placed above those of the poor. 'The Niger government,' the August 7 *London Observer* reveals, 'under instruction from the IMF and European Union, at first refused to distribute free food to those

most in need.' The powers that be did not want 'to depress the market prices' that benefited wholesalers and speculators.

Two summers ago famine hit Ethiopia not long after 'aid' institutions controlled by western governments pressured the country to eliminate intervention in the agricultural sector. *The Wall Street Journal* reported that, 'the government, under pressure from international lenders and aid donors, was pulling out of the grain markets in favour of an under-funded and inexperienced private sector. However, little provision was made to support this fledgling free market with storage facilities, transport and financing.' (July 1, 2003) At first, reducing government involvement didn't appear to be a problem since, according to the newspaper, Ethiopian 'grain harvests in the latter half of the 1990s averaged 11 million tons annually, about four million tons more than in the 1980s. In the bumper years of 2000 and 2001, harvests hit more than 13 million tons.' Improved harvests concealed the wrongheaded nature of market-based agricultural policies. Larger harvests actually

he says all he needs to do is wait for me to change my address on my ID card. he told me he knows someone he can bribe to find out where the refuge is. they will fine me £1000 if i dont get my card updated, so i have no choice - i have to. my caseworker is really worried but there is nothing she can do, i am scared too now.

he will find me and try to take Jane



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exacerbated the eventual food shortage.

As the state reduced its role as price stabiliser, farmers began to produce less, since big yields brought less income. 'A 220lb bag of corn that could go for \$10 in good times,' the *Journal* reported, 'was getting as little as about \$2 – and that was less than half the standard production costs.' Farmers who produced for sale decreased their production or focused on subsistence crops. Suddenly food became scarce and thousands died.

Similar to the situation in Ethiopia, in 2002 there was a famine in Malawi. The World Bank, IMF and EU pressured the Malawian government to reduce its grain reserves from 167,000 tonnes down to 30,000t. Malawi was pressured to reduce grain reserves for ideological reasons and to pay off a \$300m loan to a South African bank. The sell-off caused a drop in local prices, reducing many farmers' ability to produce. It also resulted in a smaller drought reserve. In human terms, these 'market' policies resulted in the unnecessary deaths of countless individuals.

Pressure to reform agricultural security has developed across Africa. 'The [World] Bank has long prodded poor African governments,' according to the *Journal*, 'to privatise their agriculture sectors and abandon any type of farming subsidies.' Likewise, IMF ideologues oppose the state as food security guarantor. Commodity boards that fixed producer prices and collected farmers' produce are being abolished and the task is being handed over to an incapable or unwilling private sector. In addition, subsidies to small farmers are being curtailed.

The supply of food, however, is too important to be left up to the market, which is why most rich countries have supply management systems and plans for food security. Many African nations are under huge pressure to follow policies that no rich country follows. Unfortunately, unnecessary famines exacerbated and even brought about by forced economic liberalisation are nothing new. In *Late Victorian Holocausts* Mike Davis recounts the circumstances surrounding a number of horrific famines in India, Brazil and China between 1870-1900.

In the late 1870s and 1890s, between 30 and 60m people died during famines in those three countries. The reason, Davis argues, is that 'free' market reforms exacerbated ecological devastation. British imperialists undermined domestic agricultural security, consciously destroying China and India's long-established food security systems. According to a British statistician, who analysed Indian food security measures in the two millennia prior to 1800, there was one major famine a century in India. Under British rule it was one every four years.

On top of the roughly 20 million Indians who died from starvation, India's economy stagnated. In 1800 India's share of the world's manufactured product was four times that of Britain. By 1900 India was almost totally under British control and the ratio was 8-1 in England's favour. Likewise African economies that have adopted neoliberal reforms have stagnated or declined.

If the North American media allowed Niger's starving child a few words she might tell the neoliberal economist, 'free markets and food don't mix, unless you're trying to kill me.'

■ Yves Engler is the author of two upcoming books: *Canada in Haiti: Waging War on the Poor Majority* (with Anthony Fenton) and *Playing Left Wing; From Rink Rat to Student Radical*.

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CAUSE FOR CONCERN

The European Commission has just cleared Monsanto's GM maize for use in the EU. Yet, as **Jeffery M Smith** reveals, proper analysis of tests done to gain that approval suggest it should never have been given.

When rats were fed Monsanto's genetically modified (GM) maize Mon 863, they didn't fare too well. In fact, Professor Gilles-Eric Seralini says they likely suffered a toxic reaction. It was difficult to pinpoint. Their increased basophils could mean allergies. Increased lymphocytes and white blood cells suggest infections, toxins or disease. The drop in immature red blood cells can occur with anaemia; and lower kidney weights may mean blood pressure problems. The rats also had increased blood sugar levels, kidney inflammation, liver and kidney lesions – they were a mess. What Seralini and other scientists wanted were further tests. What they got instead was approval of the maize on 8 August by the European Commission.

Mon 863 was not the first EU-approved GM food to have shown significant health effects in rats. According to Seralini, a molecular endocrinologist and member of two French government commissions that evaluate GM food, an oilseed rape (GT 73), Roundup Ready maize (NK 603), and two *Bt* maize varieties (Bt11 and Mon 810) all showed statistically significant problems such as inflammation disorders and liver and kidney problems. Seralini said the effects of the GM crops were similar to pesticides.

But Mon 863 is unique. Not for the number of rat anomalies – others had more. Rather, its rat study is not secret. Biotech companies usually hide their research from the public claiming it is confidential business information. Seralini says, 'No one can understand, even among EU regulators, why the composition of the blood of rats that have eaten the GM is secret.' But on 20 June, 2005, a German court ruled in favour of Greenpeace, forcing Monsanto to release the Mon 863 study. With data in hand, we can understand why Seralini was so

concerned. Moreover, we now know how much the pro-GM European Food Standards Agency (EFSA) and European Commission were willing to overlook in order to keep GMO approvals on track.

In the study commissioned by Monsanto, test rats ate Mon 863 maize, which produces *Bt*-toxin to kill the corn rootworm. The control group ate non-GM maize from the same 'parent line', ie corn whose genetics were the same before the *Bt* gene was inserted. Using the parent line is important. It minimises differences in the diet so that the impact of genetic modification stands out. And it did. According to the experimental design, the health effects in the GM-fed group were not due to chance. Nonetheless, Monsanto convinced EFSA to disregard the statistical significance and declare the maize safe. Here's how.

1. Researchers used six additional control groups, each fed commercial maize varieties with varying genetics. Some changes in the test rats were no longer significant when compared to this much larger combined group. But according to Arpad Pusztai, an authority in animal nutrition studies and leading expert on GM research, comparisons with rats fed mixed genetic varieties are inappropriate and irrelevant for safety assessments.

2. Many health effects, nonetheless, remained significant even compared to these 'artificial' controls. So Monsanto claimed that they were biologically irrelevant if they fell within a wide range considered 'normal' for rats. To put this into perspective, suppose that a group

of women who were fed a carefully controlled diet developed 50 per cent more breast cancer than women on another diet. Using Monsanto's logic, the findings can be dismissed because the increase was still within the normal variability of breast cancer for the whole population. Thus, Monsanto dismissed a 52 per cent decrease in immature blood cells as 'attributable to normal biological variability'. According to Pusztai, an

Several features of Monsanto's study appear to have been rigged in order to avoid finding problems with its maize

allowance of five per cent variability is the norm in food experiments. Similarly, he says that the increase in blood sugar levels by 10 per cent 'cannot be

written off as biologically insignificant, given the epidemic of diabetes'.

3. In spite of the statistical slight-of-hand, several results were *still* outside Monsanto's 'normal' range. They offered another excuse. Since the reaction among the rats was not consistent between males and females, it was not significant. 'This is really ridiculous,' says Seralini, who points out that everyone studying cancer and endocrinology knows that there are reaction differences between genders.

4. And when the gender defence did not apply, Monsanto dismissed results claiming the reactions were not dose specific. Specifically, changes in rats whose diet was 11 per cent Mon 863 were sometimes more pronounced than those fed a 33 per cent diet. Here again, Seralini says Monsanto's claims conflict with scientific understanding. In endocrinology and toxicology research, differences are not always proportional to their effects. A small dose of a hormone,

for example, can cause a woman to ovulate, while a larger dose can make her infertile.

5. When all other excuses failed, Monsanto claimed that with such a large study, one would expect lots of results to fall in the statistically significant category purely by chance. Thus, no follow-up is required. Pusztai, commissioned by the German government to evaluate the study in 2004, wrote, 'It is almost impossible to imagine that major lesions in important organs (kidneys, liver, etc) or changes in blood parameters (lymphocytes, granulocytes, glucose, etc) that occurred in GM Maize-fed rats, is incidental and due to simple biological variability.'

Rigged and shoddy research

Several features of the study appear to have been rigged to avoid finding problems. Nutritional studies, for example, typically use young, fast-growing animals, which are sensitive to toxic and nutritional effects. Monsanto used a mix of young and old animals, which may have hidden serious problems. Similarly, they used rats with a huge range of starting weights. Male rats ranged from 198.4 to 259.8 grams (or 143 to 186 grams according to conflicting data in the study's appendix). According to Pusztai, starting weights should not vary more than two per cent from average. The wide range 'can make it impossible to find significant differences... at the end of the experiment.'

African aid recipients rely on maize for about 90 per cent of their calorie intake. Rats are stand-ins for humans. According to Pusztai, researchers should have started with the maximum amount of corn possible (while maintaining a balanced diet), and then used lower concentrations to evaluate dose effects. The maximum amount of GM maize fed to the rats was 33 per cent of their diet, constituting only about 15 per cent of their protein.

According to Seralini, Mon 863 is new and unique; it differs from natural *Bt* toxin in seven ways. It should require at least the level of evaluation used for chemical pesticides. In the EU, that requires research on three types of mammals, with studies ranging from 90 days to two years. Mon 863, however,

was approved after only a short 90-day rat study. Chronic and reproductive problems, and impacts on the next generation would all be missed. And the study had just two observation times (week five and week 14) using analytical methods that are half a century old. They ignored powerful new methods, such as profiling techniques, DNA chips, proteomics, and others.

Some of the reported weight measurements were also bizarre. One rat dropped 53 grams in one week and gained 102 grams in the next. Some that were heaviest at the beginning of the experiment were the lightest at the end. And the rats hardly grew at all during the last four weeks.

Overall, the research paper was confusing, conflicting, poorly reported and at a whopping 1,139 pages, seemed to try and hide results in a mountain of irrelevant material. It failed to disclose the methods used to measure changes and therefore the research cannot be repeated and the results remain suspect.

Referring to the study as a whole, Pusztai says: 'Nutritional scientists and leading journals would not accept these blatant inadequacies and misinterpretations.' He adds, 'It is odd, therefore, that it remains the central document considered by government regulatory authorities upon which to make a decision to protect the health of European citizens.'

The German court's decision to make the Mon 863 study public may open the door for more such revelations. Without disclosure, says Seralini, just a few toxicologists can make the decision without public evaluation. And too often, the decision-making body is heavily influenced by the applying company. This appears to be the case with his French Commission for Biomolecular Genetics (CBG), which originally refused to approve Mon 863 based on the evidence. The CBG's president, a geneticist who works very closely with industry, asked a consultant to re-evaluate just one

significant difference and then forced a second vote without a quorum. With only five of 18 members present, Mon 863 passed three to two. According to Seralini, one of the scientists who voted

in favour is a toxicologist who, oddly enough, is 'always against long animal toxicity tests'. In fact, he had been part of the French committee that approved Novartis

We still don't know how sick the rats were that ate Monsanto's GM maize. And we have no idea of its impact on humans

(now Syngenta) E 176 corn after it had been tested for only two weeks with three cows. Actually, there were four cows at the start of the study, but one died and was removed.

That toxicologist is also on EFSA, which has come under attack for including primarily pro-GM scientists. 'One member has direct financial links with the biotech industry and others have indirect links,' according to a November 2004 report by Friends of the Earth. Several members, including the chairman, have been part of an EU-funded project with the stated goal to 'facilitate market introduction of GMO's in Europe'. And 'two members have even appeared in promotional videos produced by the biotech industry.'

It is no surprise, therefore, that EFSA endorsed and even repeated each of Monsanto's excuses why the statistically significant health effects of rats fed Mon 863 were not relevant. The majority of EU Council of Ministers, however, ignored EFSA's recommendation and on 24 July voted *not* to approve the Mon 863. But since EU law requires a 'qualified majority', it was passed onto the Commission who gave its approval for consumption by European citizens.

Perhaps EFSA and the European Commission will be more careful to require truly scientific arguments and rigorous research, now that industry studies may be made public. In the meantime, we still don't know how sick the rats were that ate Mon 863. And we have no idea of the impact on humans.

■ Jeffery M Smith is the author of *Seeds of Deception*

NATURE? DO THE MATHS

Mathematics is at the heart of any research and, in nature, it can be used to predict and enhance our surroundings and ultimately control it. The logical conclusion to this concept is frightening: there could be a mathematical formula for every aspect of life

BY MALCOLM TAIT

Fill a thimble full of soil, analyse it, and you'll have 10,000 bacterial organisms to look at. Isn't that amazing? Well, it's also, apparently, untrue. Investigators at New Mexico's Los Alamo national laboratory have been digging deeper than most into the science of prokaryotes – single-celled beings – and finally announced in early September that there's a damn sight more of them than we'd previously thought. 10,000 organisms in a thimble of soil? That's small fry, yesterday's figure. Try this number on for size – one million.

If that's not mind-boggling enough, what about this? In a garden with one ton of soil there could be as many as 10,000 trillion prokaryotes – that's about 10,000 times the number of stars in the Milky Way. 10,000 trillion! And to think that you and I once thought there were only about 100 trillion of them. How could we have been so short-sighted? Probably because we dropped out of maths after O level.

Mathematics is the new mantra in the extremities of nature study. No one, after all, is going to count the numbers of single-celled creatures in a ton of soil, but a computer program can. By inputting data such as behavioural patterns, reproduction rates, predator-prey systems, longevity and many other control factors, a reasonable mathematical model can be developed that can predict population sizes and movements of virtually anything from a bacterial community to a herd of antelope. It all comes down to making sure you've built in as many factors as possible. And of course, the models you end up

with can then become factors in newer models. Developed a model for predicting weather patterns? And another for deer devastation of trees? Why not add them into your woodland management model to get an even clearer picture. Steadily this interdisciplinary research can help build predictive models for just about anything.

Of course this is not pure mathematics but applied. No one's going to do this sort of work unless there's a grant at the beginning of it or a consultancy at the end. The bacteria-in-soil conclusions have spun out of research into the toxicity of metals such as lead within soil. Another recent mathematical study of bacteria in sewage was conducted to help develop engineering projects to reduce health problems from sewage in developing countries.

On the face of it, hard to quibble with the justifications for these research projects. But just how far can we go? For many mathematicians and bio-engineers, the answer is: as far as we can. 'Mathematics, rightly viewed, possesses not only truth, but supreme beauty,' wrote the great mathematician and logician Bertrand Russell, 'a beauty cold and austere, like that of sculpture'. There's something rather prescient about those words. Sculpture is, of course, a human creation, and Russell's equating of design with the science of mathematics is oddly predictive of today's ability to create new strains of plant and animal through genetic manipulation – a science that is based at principle upon no less than mathematical models. If we can use mathematics to predict nature, and if complete prediction of

nature can lead to its manipulation and control, then we have the rudiments of that most intimidating of concepts: a mathematical formula for all aspects of life. 'Our experience up to date,' said Einstein in 1922, 'justifies us in feeling sure that in nature is actualised the idea of mathematical simplicity.'

Do we have the ability to discover such a level of 'mathematical simplicity', and stare at such a 'supreme beauty'? Who can say? But even if we can, should we? As the answer is subjective, let's let the world of fiction answer it for now. William Boyd's fine novel *Brazzaville Beach* contains the character John Clearwater, a mathematician of great stature and intensity who spends his time trying to develop a way of reducing the ebb, flow, flux and chaos of all life into a series of manageable formulae and equations. The closer he gets, the more manic he becomes, and towards the end of the book, he appears to be on the brink of his mighty discovery. We then hear little about him for a while, and when we next come across him, it is to discover that he has drowned himself, his eyes staring up through the water under which he lies at truths that he either could not find... or could not bear.

■ Malcolm Tait's new book, *The Countryside Companion*, is published by Robson Books

Even If we can use mathematics to predict nature and stare at its 'supreme beauty', should we do so?

and logician Bertrand Russell, 'a beauty cold and austere, like that of sculpture'. There's something rather prescient about those words. Sculpture is, of course, a

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A man wearing a blue hairnet, glasses, and a blue polo shirt is holding a large salmon. He is also wearing a red apron and a black headset. The background is a plain white wall with a sign that says "GUTTING HALL".

FARMED SALMON

It's laced with pesticides, dioxins and PCBs. It's threatening wild salmon with extinction. No wonder we're only advised to eat it once a month.

Employee in the gutting hall of a salmon farm operated by Dutch company Nutreco, the biggest salmon producer in the world. In Scotland, where upwards of 50 million farmed salmon are produced each year, the industry claims to support around 7,000 jobs, with Nutreco (known as Marine Harvest in Scotland) claiming to support some 1,400 jobs. Yet according to the Scottish Executive's own figures, direct employment in fish farming accounts for only 1,300, mostly poorly-paid, jobs. Furthermore, it is estimated that 5,000 sport angling and tourist-related jobs have been lost in the country because of the expansion of factory fish farming.

Whatever the actual figure, fish farms destabilise communities. Having only set up shop in Scotland a few years ago and lured people to work for it with promises that fish farming would 'save' their communities and 'secure' their financial future, Marine Harvest has since closed fish processing plants in Stornoway and Scalpay in the Western Isles, as well as fish farm sites throughout the West Highlands. The introduction of automated feed systems to their farms has further reduced the direct work force on each site by up to 50 per cent.



The salmon may be leaping, but it's more likely to be in a bid to escape than as any expression of joy. Over the past five years in Scotland over one million fish have escaped from fish farms. When farmed salmon escape into the wild they can spread parasites and disease over a wide area. For example, escapees from a farm in Northern Ireland on the Glenarm River in August 2001 were caught as far away as rivers in North Wales and the Solway Firth on the England/Scotland border. Escapees can also interbreed with wild salmon and hybridise with brown trout, thereby decreasing the fitness of the wild population (so-called 'genetic pollution'). Some west coast Scottish rivers now contain only escaped farm fish and their progeny, and many fishery biologists believe wild salmon to be extinct in 15 west coast rivers. Furthermore, because farmed salmon are fed an artificial diet consisting of fishmeal and fish oil, for which the journal *Nature* calculated it took over three tonnes of wild fish to produce one tonne of farmed salmon, they threaten the sustainability of many



species of wild fish too.

Cramming up to half a million farmed salmon on a farm helps the spread of infectious diseases and parasitic infestation. Diseases on Scottish salmon farms include *Infectious Salmon Anaemia* (ISA), *Bacterial Kidney Disease* (BKD) and *Infectious Pancreatic Necrosis* (IPN). In 1998, ISA led to four million fish being slaughtered and a quarter of the industry being quarantined. IPN currently affects over half Scotland's fish farms and threatens wild salmon stocks.

To make matter worse, parasitic sea lice breed in billions in farm salmon cages, and then attack and kill wild salmon and sea-trout as they pass by. Many West Highland and Island rivers and lochs that once supported large populations of wild salmonids are now devoid of these species.

To counter the spread of such diseases, factory salmon farms rely on toxic chemicals. A typical salmon farm in Scotland, for example, is authorised to use over 30 different antibiotics, such as *oxytetracycline*, as well as antiparasitics and antifoulants

such as copper and zinc paints. Today, throughout the world, farmed salmon are fed more antibiotics per pound than any other livestock – thus contributing to the worldwide problem of antibiotic resistance. The farms also discharge contaminated waste (including the above mentioned chemicals, uneaten feed, faeces and sea lice) directly into the sea. WWF Scotland estimates that salmon farms generate sewage waste equivalent to untreated sewage from nine million people (the population of Scotland is 5.1 million).

No wonder that when earlier this year the Scottish Environment Protection Agency published a list of companies with the worst pollution record in Scotland, one of them was Marine Harvest Limited. The company's latest appearance in court on a pollution offence was as recent as 27 July when it was fined £4,000 for polluting the River Lochy with waste from its fish processing plant at Blar Mhor in Fort William. Marine Harvest admitted permitting fish remains, blood and congealed fat to enter the river.

Health benefits derived from eating wild salmon are a direct result of the fish's natural lifestyle. Swimming hundreds of miles in a lifetime while consuming a diet high in algae, shrimp and krill, produces a fish with a firm flesh, a natural pink colour and a high level of omega 3 fatty acids in its body fat. The cramped, stressful and sedentary lifestyle of the farmed fish produces a totally different animal with little to enrich our health.

They may look bright and pink, but the colour of farmed salmon comes from eating pellets of concentrated fish products that contain colorants such as *astaxanthin* and *canthaxanthin*. Derived from microalgae, and relatives of the antioxidant beta-carotene, both nutrients are important elements of the diet of wild salmon. But the *astaxanthin* and *canthaxanthin* fed to salmon are highly concentrated and synthetically derived. The effect on humans is largely unknown, though *canthaxanthin* in very high quantities has been shown to damage vision by causing fluid retention in the eye. The European Commission, concerned over the levels of *canthaxanthin* in farmed salmon and trout, proposes to reduce permitted levels by four times.

Many supermarkets promote their salmon as being 'high in omega 3' – essential fatty acids known to protect against heart disease. But the fat on farmed salmon is very different from the wild fish. Farmed salmon have four times more body fat than wild salmon (15 per cent compared to four per cent) and this comprises 200 per cent more artery-damaging saturated fat and, according to the *American Journal of Clinical Nutrition*, two to three times less omega 3 than that of wild salmon.

The high level of fat in farmed fish also means that they store more toxins than their wild cousins.





SMOKED FARMED SALMON

Bright and pink thanks to the colourants astaxanthin and cantaxanthin

In the most comprehensive analysis of farmed and wild salmon to date, published in the journal *Science* in 2004, researchers analysed toxic contaminants in a representative sample of approximately 700 farmed and wild salmon (totalling two metric tons) collected from around the world. The study revealed high levels of carcinogenic PCBs (polychlorinated biphenyls) in every sample, however farmed salmon was significantly more polluted than wild salmon.

In addition, the farmed salmon had higher levels of 13 other similarly toxic contaminants, including dioxin and several pesticides no longer used in the United States such as DDT, dieldrin and toxaphene. Dioxin is a general term for an extremely toxic group of chemicals that are byproducts of industrial processes and waste incineration.

European farmed salmon had greater amounts of all the contaminants than North and South American farmed salmon. However, farmed salmon in the Americas was still worryingly polluted.

These results mirror those of other smaller studies, including a 2002 study by the UK Pesticides Residues Committee which published results of a study of fresh and canned salmon for 10 organochlorine pesticide residues. Of 73 salmon tested, 71 contained residues and 32 contained multiple residues (*DDT, Chlordane and hexachlorobenzene*).

Likewise in July 2003, the Environmental Working Group (EWG) released a report stating that farmed salmon purchased in the United States contained the highest level of PCBs in the food supply system. The group found that farmed salmon had 16 times the level of PCBs found in wild salmon, four times more than in beef, and 3.4 times more than in other seafood and the group recommended consumers to eat farmed salmon no more than once a month.

For more information go to www.salmonfarmonitor.org

BEHIND THE LABEL

LISTERINE TEETH & GUM DEFENCE

A little mouthwash to make your tongue and gums feel fresh and clean? Beware, you may be swilling a mouthful of chemicals that will give you more to worry about than bad breath. **PAT THOMAS** REPORTS

INGREDIENTS

Aqua, alcohol, sorbitol, aroma, poloxamer 407, benzoic acid, sodium saccharin, eucalyptol, methyl salicylate, thymol, menthol, sodium benzoate, sodium fluoride, CI 42053, CI 47005

We all know that brushing and flossing keep teeth and gums healthy. Nevertheless, in the pursuit of the perfect smile consumers are currently being encouraged 'to develop a repertoire of oral care purchases' – in other words, buy more stuff.

Traditionally a mouthwash is an antiseptic gargle that helps remove the bacteria that cause bad breath. But today mouthwashes claim to fight plaque, strengthen teeth, prevent tooth decay and provide all-day freshness as well. Potential mouthwash users are apparently one of the great untapped markets and strategies to exploit this market, particularly in the UK, have paid off. Last year Brits bought 34 million bottles of mouthwash. According to Pfizer Ltd, owners of the Listerine brand, more than 900,000 people in the UK started using mouthwash for the first time last year and over half these were purchasing Listerine, the UK's number one brand. In the US, 147 million bottles of mouthwash flew off the shelves, with Listerine accounting for 53 per cent of these sales.

Occasionally, however, marketers push too far. Earlier this year print ads for Listerine featured a bottle balanced on a scale opposite a floss container, and said: 'Listerine antiseptic is clinically proven to be as effective as floss at reducing plaque and gingivitis between the teeth.' A US federal judge ruled this was false, misleading and constituted a public health risk.

Although mostly water, today's magic bullet mouthwashes are also full of harsh chemicals.

For instance, most mouthwashes contain alcohol. Listerine original formula contains 26.9 per cent alcohol, more than four times that of many malt liquors. Other varieties, like this one, are 21.6 per cent alcohol.

Long-term use of alcohol-containing mouthwashes dries and changes the pH of the mouth and throat and is associated with an increased risk of mouth and throat cancers. If a mouthwash contains a harsh detergent like cocamidopropyl betaine, this compounds the damage. Listerine contains a slightly milder detergent, Poloxamer 407, but its unique qualities – being soluble in liquids at low temperature, but turning into a gel at higher temperatures (ie body temperature) – makes it a film former, keeping other toxic ingredients on the surface of the mouth for longer.

Mouthwashes also commonly contain fluoride, a systemic poison, and this product is no exception. It contains both sorbitol and more worryingly saccharin, which causes bladder cancer in animals.

Finally there are synthetic colours, aromas and flavourings. Flavourings and aromas are basically perfumes. At best they mask odour temporarily; and since they are composed of volatile solvents, they can also alter the basic flora of the mouth in the same way as alcohol and may cause dermatitis around the mouth. Combinations of several strong flavourings may be particularly irritating, and methyl salicylate (oil of wintergreen), eucalyptol (oil of eucalyptus) and thymol – even if they are naturally derived – are also highly toxic. Just 10ml of methyl salicylate can poison a child; 30ml can poison an adult.

In addition, bright colours and nice smells mean that children find mouthwashes so intriguing that each year hundreds accidentally get smashed on as little as two ounces. So do adults; earlier this year an American woman was arrested for drunk driving after drinking three glasses of Listerine.



INGREDIENTS	PURPOSE	ADVERSE EFFECTS
Alcohol	Antiseptic, antibacterial	Dries and denatures mucous membranes in the mouth; changes mouth and throat pH; promotes mouth and throat cancer.
Sorbitol	Sweetener, tartar control agent	Mostly safe, but if swallowed can cause bloating, diarrhoea.
Aroma	Fragrance	Perfume by another name, composed mostly of solvents; drying to the mouth and potentially neurotoxic; allergic reactions may mimic common dental problems such as bleeding gums, mouth ulcers, gingivitis.
Poloxamer 407	Surfactant, detergent, film former	Chemically similar to polypropylene glycol (PPG) and polyethylene glycol (PEG), thus potentially contaminated with 1,4-dioxane and ethylene oxide, impurities linked to breast cancer. In medicine it's a vehicle for injected drugs and an ointment and suppository base.
Benzoic acid, Sodium Benzoate	Preservative, anti-bacterial	Allergens, sensitisers; urticaria, asthma, rhinitis and anaphylactic shock have all been reported following oral, dermal or inhalation exposure to both substances.
Sodium saccharin	Sweetener	Carcinogenic – linked to bladder cancer in animals. Banned in US.
Eucalyptol (Oil of Eucalyptus)	Fragrance, antiseptic	Allergic skin, nose and eye reactions, inhalation may trigger asthma; vocal cord dysfunction in sensitive individuals. Ingestion can cause vomiting, stomach pains, seizures, abnormal heart rhythms, bleeding, coma and death.
Methyl salicylate (oil of wintergreen)	Fragrance, antiseptic	Respiratory tract, skin and eye irritation; allergic reactions; small ingested amounts are fatal to young children; may cause reactions in aspirin-sensitive people.
Thymol	Fragrance, antiseptic	Derived from thyme oil; harmful if swallowed, may cause irritation to skin, eyes, and respiratory tract, affects central nervous system. Common fungicide.
Menthol	Fragrance, antiseptic	Irritation to skin, eyes and respiratory tract.
Sodium fluoride	Antibacterial, strengthens tooth enamel	Fluorosis – spotting, mottling and yellowing of the teeth especially in children; osteoporosis – ingested fluoride leeches calcium from the bones; allergy/hypersensitivity reactions; ingestion can cause nausea, vomiting, epigastric pain and diarrhoea.
CI 42053, CI 47005	Colourings	CI 42053 (Fast Green FCF) is a skin, eye and respiratory irritant; the International Agency for Research on Cancer (IARC) lists this coal tar dye as an animal carcinogen. CI 47005 (Quinoline Yellow) is a coal tar dye that causes contact dermatitis and sensitisation. Banned in the Australia, USA and Norway.
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 Data Safety sheets (MSDS).		

ALTERNATIVES

Bad breath comes from sulphur-producing bacteria on the tongue. With good basic oral hygiene – including keeping your tongue clean – mouthwash is not necessary. If you have persistent bad breath it could be because of gum disease or some other underlying infection. A trip to the dentist is what's needed. For mouthwash die-hards there are several more natural products that are alcohol-free and don't contain such a large collection of worrying ingredients. The following products are alcohol- and saccharin-free:

Aloe Dent Mouthwash
www.optimah.com

Eliminator
www.anewlife.co.uk

KiwiHerb Manuka Mouthwash
New Zealand Natural Food Company
www.goodnessdirect.co.uk

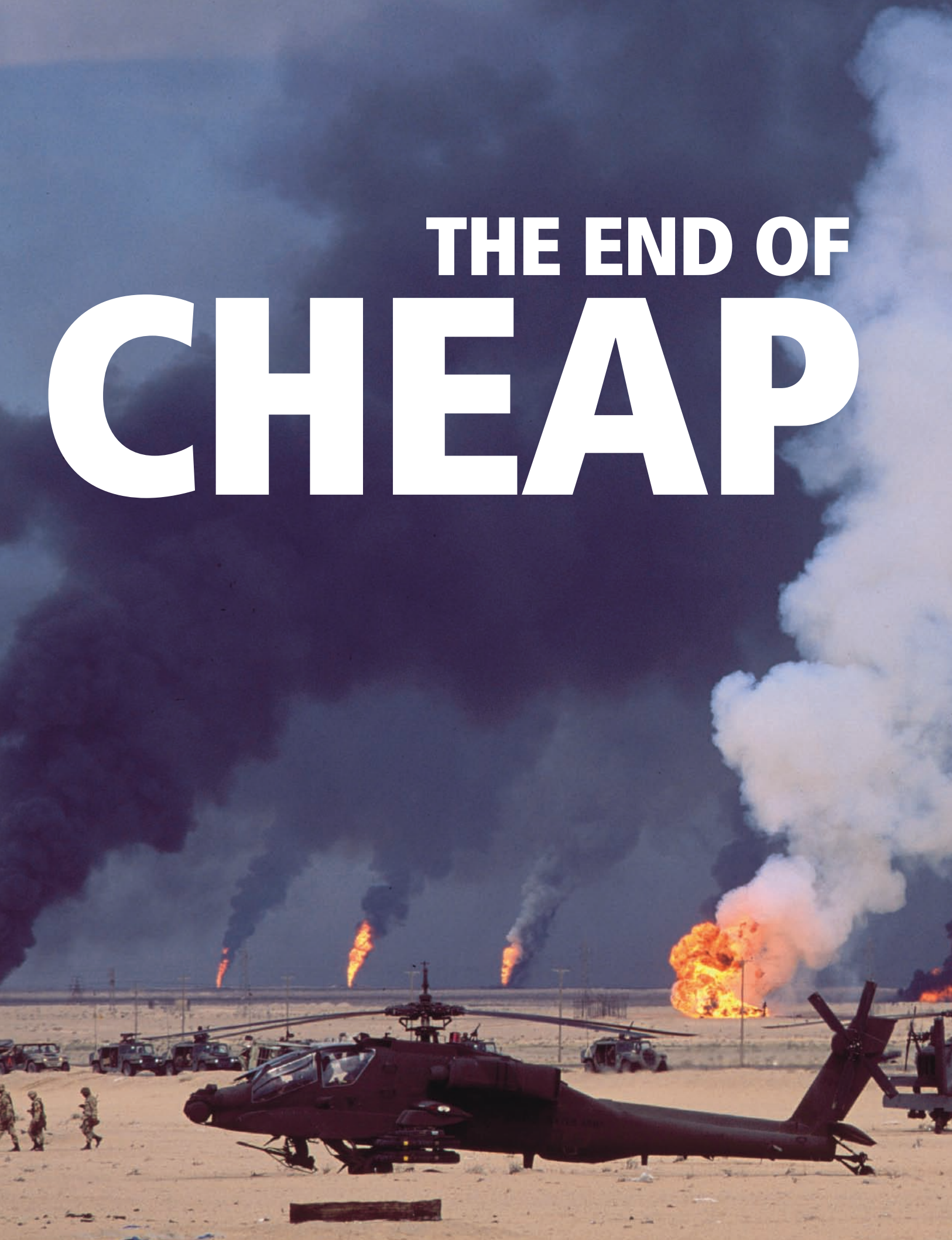
Sarakan Mouthfresh
Arrowmed Ltd
(01420-544424)

Tom's Baking Soda Mouthwash
www.tomsofmaine.com



■ Pat Thomas is the author of several books on the environment and health, including *Under the Weather: how the weather and climate affect our health* (Fusion Press), and *Cleaning Yourself to Death: how safe is your home? and Living Dangerously: are everyday toxins making you sick?* (both published by Newleaf)

THE END OF CHEAP



OIL

Oil currently sustains 6.9 billion people on this earth, and yet it is proving harder to find, harder to extract and harder to produce. What's more it's at the heart of the global economy, driving growth, maintaining overstretched supply lines, and creating the illusion that we, the human race, are above nature's constraints.

DAN BOX REPORTS



Above the noise in the bar of the exclusive Carlton Tower hotel, just off London's Sloane Square, Frank Timis was talking about himself. 'I nearly killed 100 guys yesterday,' he said in his thick Romanian accent. Even for Timis, the boastful, buccaneering chairman of Regal Petroleum, this was an unusual way to open the conversation.

Pausing to stub out his cigarette, Timis began to explain. Regal had, he said, found oil the previous day off the coast of Greece. So much oil, under such pressure, that it could easily have destroyed the drilling platform and ended the lives of all those working on it. 'There is a billion barrels of oil there, all crude, all underwater but easy to get to,' Timis said. 'This is easily one of the biggest finds in the history of Europe.'

Soon after he publicly announced this discovery, Timis became the talk of the City, where big institutions including Merrill Lynch and Commerzbank bought into his company, sending its share price flying. Once valued at about £35 million, at its peak Regal was worth over £500 million. Timis, a former Romanian

refugee who had fled the Ceausecu regime for Australia where he was convicted twice for heroin offences, seemed to revel in his role as London's new oil baron.

Then, in May, the bubble burst. Regal

was forced to announce that, despite the hype, 'flow rates achieved from the Kallirachi well were minimal and deemed to be non-commercial.' While the reservoir might indeed contain a billion barrels of oil, there was no way of getting it out of the ground fast enough to cover the cost of running the drill rig. In short, the well was a dud. The news caused the value of the company to collapse. Its shareholders suddenly became desperate to sell, and Timis lost his job.

Regal's story is typical of the current oil rush that has seen the price of oil more than double since 2004, to all-time highs of over \$70 a barrel. As the oil price rose, so did the City's excitement. Investors poured their money into oil stocks, driving up the value of companies such as Regal. Inspired by this and by the multi-billion dollar profits being posted by the oil giants like BP and Shell, a new mob of smaller exploration companies set up to scour the world for new reserves, all looking to cash in.

However, it is Regal's subsequent collapse that reveals the real story. Yes there is still oil out

there – both reserves that we know of, and sources still to be found. But in the rush to satisfy our ever increasing appetite for oil, we have used up almost all the oil that is easy, and therefore cheap, to obtain. The century long era of low-priced oil, and with it everything upon which our lifestyles depend, is about to end.

An insatiable thirst for oil

Figures from the International Energy Agency (IEA) show that in 2004 the world consumed an average of 82.5 million barrels of oil every single day, or if you prefer just over 30 billion barrels a year. Staggering in absolute terms, but even more astonishing to know that this represents an increase in oil consumption of over 20 per cent in just over 10 years.

In the first six months of this year the IEA has been forced to revise its estimates of demand growth for 2005 upwards four times. It has also had to hastily reassess its prediction that world demand would only increase by another 10 per cent by 2010; it now expects almost half this increase to have come by the end of this year.

What or who is driving this demand? You need look no further than China. Over the last 25 years, world oil demand has continued to grow, but at a fairly stable average of about one per cent a year. Five years ago this all began to change, with the economic boom in a number of developing countries, most of all China.

Chinese oil demand has doubled over the last 10 years, making it today the world's second biggest oil consumer after the US. The world's most populous country is also much less energy efficient than the US or UK. Its economy uses, on average, 1.5 barrels of oil for every \$1,000 of economic output – twice the global average. The impact has been huge: almost half of new global demand since 2001 has come from China

To understand where all this will lead, the entire board of directors at the British oil giant BP flew to China this May to meet with senior politicians. What they learnt amazed them, and left them deeply worried. Within the next few years, they were told, 300 million Chinese will desert the country's farms for its cities. As a result, China will need a vast number of new roads, railways, factories and houses and, for that, they will need yet more oil. Chinese oil consumption (which rose 17 per cent last year alone) is now expected to double again over the next 15 years.

Peter Davies, chief economist at BP, believes the impact of Chinese demand for energy has knocked away one of the foundations of the world economy. In the past, apart from the oil shocks of the 1970s, world demand for oil has been

The century-long era of cheap oil, and with it everything upon which our lives depend, is about to end

matched by supply and the price has remained low. But back then a huge proportion of the world still lived simple agrarian lives less reliant upon the consumption of fossil fuels. Globalisation has changed all that. As the board of BP learnt, the farmers of China (and India, Asia and Africa) have been told it's time to upgrade their oxen to Audis. The whole world is now set on the same fossil fuel dependant path. As Davies explained at the launch of BP's annual Statistical Review of World Energy in June: 'Energy consumption is higher, prices are strong and growth has increased. This is a new starting point.'

Can we meet this demand?

The Cantarell oilfield, in the shallow waters of the Campeche Bay, is regarded in the Mexican oil industry as the country's crown jewel. It is the world's second-largest oil field by production, pumping about 2.2 million barrels of oil, as much as every oil field in Kuwait put together.

For that reason, the news from Petroleos Mexicanos, the state oil company, that the field's production would begin to decline this year was met with dismay. Declining production from a field typically means the pressure the oil is under is falling, so other fluids or gas must be pumped in to force what remains out of the ground, making the work harder and more expensive. The decline also ultimately leads to the point when, although much of its oil may remain in place, oil companies turn their back on the field as it has become too expensive to justify the work.

Cantarell, however, is not alone. Around the world entire countries are now suffering huge yearly declines in their oil production, tightening the world's supply and helping to push up prices. Among the most severely effected is the UK, which produced just over two million barrels of oil a day last year, a fall of over 10 per cent on 2003 and down from a peak of almost three million barrels a day in 1999. The same pattern can be seen in many of the other major oil-producing countries – the United States, Indonesia, Norway, Venezuela, Oman, Syria – in each, oil production has risen year on year until it hit a peak, after which it steadily declined.

This gloomy outlook was backed up this July by Chevron, the US's second largest oil company, which took out a series of double-page adverts in some of the world's leading business papers,

including the *Financial Times* and *The Economist*. These read: 'Energy will be one of the defining issues of this century, and one thing is clear: the era of easy oil is over... Many of the world's oil and gas fields are maturing. And new energy discoveries are mainly occurring in places where resources are difficult to extract – physically, technically, economically, and politically.' The adverts, were signed 'Dave' – David O'Reilly, the company's chairman – unprecedented candour from a notoriously gung-ho industry.

Chevron's relative candour aside, ask any of the major oil companies publicly about peak oil and the line is always the same – we have enough oil to meet the current level of consumption for at least another 40 years. 'We have plenty of oil – number 1 in the world,' said Mahmoud Abdul-Baqi, the Saudi Arabian state oil company Saudi Aramco's vice president of exploration, in a debate last year. 'We have the potential to add more oil than anybody else. We can do that extremely successfully at a very reasonable cost. Our track record shows that we delivered for 70 years, and we're going to continue delivering for another 70 years at least.'

His bullishness was backed up at BP. At the launch of the company's annual Statistical Review of World Energy this year, the company's chief economist Peter Davies said: 'The peak oil forecasters have been predicting it for 100 years and we keep going through their dates. The evidence is that production keeps rising. I'm sure we will find more oil, others will find more oil... but oil will not last forever. So far we have continued to add to proven reserves at least as much as we have produced and there is no sign on a global level that will not continue.'

In every respect the facts just don't bear Abdul-Baqi, Davies or the rest of the oil industry out. For one 'current levels of consumption' was made irrelevant the moment China and India swallowed the 'economic growth is good' mantra. Whilst we can only estimate how much oil we are going to need in 10 years' time, let alone 40, we do know that demand will not stay at 'current levels of consumption'.

Currently the 'oil debate' is focused on three key questions: How big are existing reserves? How much oil can we recover from existing reserves? And how much more can we find? The debate is fierce and not as one sided as the current media

Get on your bike, as all these modes of transport could soon be too expensive to run



coverage would have you believe. What's more, those who believe that demand is due to exceed supply imminently are no longer confined to the ecological / geological fringe.

How big are existing reserves?

Put simply, no one knows. The industry standard is the BP annual Statistical Review of World Energy. But at its launch this year, Peter Davies made this very clear when he said, 'I should state that BP has not tried to review published national data or tried to second guess government figures, and I should say that proved reserves do not comply to the standards set for company reports.'

As Davies admitted, BP relies on reserve figures published by national governments and does not even attempt to independently verify these itself. These figures include those provided by the member states of the Organisation of the Petroleum Exporting Countries (OPEC) – the cartel that controls about 40 per cent of world

oil production and includes Saudi Arabia, Kuwait, Iraq and Iran – who between them claim to be sitting on almost 900 billion barrels of recoverable oil. While many other countries outside OPEC

admit their oil fields are declining after decades of production, these governments say their reserves have continued to increase.

Whether this is true, however, is far from certain. Despite these figures being among the most important in the world, no one knows if they are accurate because access to the information on which they are based remains for many OPEC countries a state secret.

What is more, there is reason to believe they are not true. During the late 1980s, OPEC countries reported massive increases in their oil reserves without, it seemed, any significant discoveries. Overnight, the United Arab Emirates alone almost tripled its official total, from 32 billion barrels to 98 billion. Kuwait, Iran and Iraq also declared similar rises.

At the time, very little exploration or drilling for new oil was being done. What had taken place, however, was the introduction in 1983 of a new system of production quotas for individual OPEC

states which tied the amount they were allowed to produce to the size of their stated reserves. The more oil a country said it had, the more it was allowed to produce – and sell. This gave them a financial incentive to lie.

Between the OPEC states, the increases in reserves announced by these countries during the 1980s exceeds the total increase in world oil reserves within the BP statistics for the years 1984-1994. In effect, the increase in BP's numbers could be the result of nothing more than the OPEC heads of state exaggerating their own figures in order to obtain higher quotas. It might not represent actual oil in the ground. And now that same quota system means it is not in their interests to report that their oil reserves are declining.

The trouble is that, to date, the OPEC countries have refused calls for them to open up their reserves to independent auditing and as a result it is impossible to tell whether persistent reports of decline in the OPEC states are true or not.

To further confuse matters, in the last few years, BP has also started to include oil contained in Canadian oil (or tar) sands along with more conventional sources under its figures for world reserves. This has raised eyebrows because this is not oil that has been discovered during this time, but just reserves of tar, as opposed to crude oil, that have in fact been known about for years. This accounting change helps explain the second, smaller, increase in BP's figures between 1994 and 2004.

The result is that no one really knows how much recoverable oil there is left. But with what we now know of the industry's history of creative accounting, it's unlikely to be as much as they say it is.

How much oil can we recover from existing reserves?

It is not only the size of oil reserves that is important, however, as Regal's Frank Timis learnt to his cost – if you can't get it out quickly and easily, it's of little value to the world. It's like a jar of Marmite. No one throws the jar away when it's empty, but when it's just too difficult and time consuming to get enough on your knife to cover a piece of toast. The same is true of oil.

In June, the great and the good of British business gathered at the Chatham House members' club in central London for the launch of

To keep up with demand, the global oil and gas industry will have to spend over \$6 trillion by 2030



Shell Global Scenarios to 2025. The report, weighing in at over 200 pages, presents the oil giant's analysis of potential opportunities and threats to business over the next 20 years, and is seen as the gold standard in the industry.

Quietly, but nonetheless clearly, the report admits that production from those countries outside OPEC – which account for about 60 per cent of global production – ‘appears about to plateau in about a decade or so’. By ‘plateau’, it means the point at which production cannot increase, no matter how hard we drive the pumps. In doing so, this report backs up another, from the world's largest oil firm, ExxonMobil. Its *Outlook for Energy: a 2030 View* report forecasts a peak for non-OPEC production in just five years.

As a result, both Exxon and the US government are putting pressure on OPEC to increase its production to make up the loss. The Exxon report states: ‘Post 2010, the call on OPEC increases rapidly, requiring OPEC to add more than 1mbd [million barrels a day] of capacity per year.’

In May, Ali al-Naimi, the Saudi Arabia oil minister, claimed the desert kingdom alone could achieve that easily. According to al-Naimi, his country could increase production from its current level of about 10 million barrels a day to 12 or even 15 million. As with the figures for the total amount of oil held in the country's reserves, however, this could just be so much talk. Other analysts believe that the entire OPEC cartel has enough spare capacity to increase production by about one million barrels a day maximum, and this is heavy crude that most buyers either do not want or cannot refine. Yet again, the exact information is a Saudi state secret.

What is known is that the giant Ghawar field, which alone accounts for about 60 per cent of Saudi production, currently needs to be injected with a reported seven million barrels of sea water every day just to maintain the pressure needed to keep the oil flowing out. To many in the oil industry this sounds like a country that is working hard just to maintain its output, not one that is able to easily increase supply when needed. Even Sadad Al-Husseini, retired chief of exploration for Saudi Aramco, responded recently to American calls for Saudi Arabia to increase production by saying that: ‘The American government's forecasts for future oil supplies are a dangerous over-estimate.’

For many within the industry it is precisely through methods such as water injection that the date the world hits peak production will be delayed. As the price of oil goes up, so the theory goes, it becomes commercially viable for companies to return to reserves they abandoned

HUBBERT'S PEAK

In 1956, at a meeting of the American Petroleum Institute in San Antonio, US geophysicist, M King Hubbert predicted that US oil production – which until then had been constantly increasing – would peak in the early 1970s, and then start to fall.

To describe this he drew a graph of the total volume of oil discovered each year in the US; the result was a bell-shaped curve that started at nothing, climbed as more oil was found, then peaked and started to decline. What shocked his audience was that Hubbert went on to argue that the same bell-shaped curve model that governed the rate at which discoveries would be made could also be used to predict US oil production itself, with production of any particular oil reserve peaking and declining some years after the same points were reached for discovery, but following a similar bell curve. The reason, he explained, was that companies would naturally exploit those big, easily accessible reserves first, before turning to smaller reserves that cost more to work and produced much less oil.

At the time, almost everybody inside and outside the oil industry rejected the idea. Hubbert later said that Shell head office was on the telephone right down to the last five minutes before his San Antonio talk, asking him to withdraw his words. He refused. The controversy raged until 1970, when the US production of oil started to fall. Hubbert was proved right. The big difference between Hubbert's day and now is the number of senior analysts within the oil industry who have come to the same conclusion as him and now also predict a looming peak in global oil production.

when the oil they contain became too expensive to extract. As Albert Bressand, a vice-president of Shell and author of the company's *Scenarios* report, told me: ‘Energy supply is not just a question of physical quantities of oil in the ground. When you realise that, after huge progress, we are only recovering today an average of 30 per cent of the conventional oil within any reserve, we can increase this. We say there is another 17 years of today's consumption that would be available if that rate could be increased by 10-15 per cent.’

But there are two glaring flaws with this argument. First, it relies on faith that the technology of tomorrow will be able to solve the problems of today, something not borne out by experience. As Bressand admits, after decades of work the world's most powerful companies have still not achieved anything better than a 30 per cent recovery rate. Where, then, is this extra 10-15 per cent going to come from?’

The truth, as one industry insider explained to me, is less optimistic. ‘Anything that has been brought into production after about 1970 will have been pretty accurately surveyed and subject to impact recovery techniques pretty much since day one,’ he said. ‘No one goes out to develop an oil field badly,’ adding that the real reason people within the industry are so bullish in their statements is that: ‘Companies like to reassure their shareholders about all this new oil they

can recover. Yet if you look at the North Sea, you will find that there is only one significant field where they have managed to do anything more than sustain oil production at a very low level. So if you go into a declining oil field and throw everything at it, you might maintain a low level of production, but you won't increase it,' he said.

Secondly, even if Shell does discover this technology, Bressand's best estimate is that it will provide only another 17 years of supply at today's rate of oil consumption. And it is clear from looking at events in China and elsewhere that the world is not going to see another 17 years at today's consumption rate; in that time even the IEA predicts demand will have increased by over a quarter. Bressand's '17 years' of extra oil production simply will not last us that long.

Digging deeper

So with known oil reserves in decline and extraction proving increasingly difficult and expensive, the oil industry would like us to believe that they have another card up their sleeve, namely 'unconventional' oil reserves. Both Shell and Exxon argue that these so-called 'unconventional' sources of oil – oil sand, oil shale deposits and deep sea reserves – will soon provide a huge new source of oil.

In its *Outlook for Energy* report, Exxon estimates that there may be more than four trillion barrels of extra heavy oil and oil sands. If, as the company assumes, 20-25 per cent of this could be extracted, a potential 800 billion barrels could be available for use. There are also, Exxon said, three trillion barrels of synthetic oil capable of being produced from oil shale.

As with BP's figures however, it is best to dig a little deeper. Speak to Exxon staff themselves and they expect no contribution from oil shale even by 2030 and only about four million barrels per day from Canadian oil sands in that time – just a fraction of total world demand. What, then, explains the disconnection between the vast reserves and tiny amount extracted?

Oil sands are actually tar, formed from oil that has been degraded by water and air. Getting the oil out requires a huge amount of money and labour. It typically costs around \$15 a barrel to produce oil from oil sands, compared to just a few dollars for conventional crude. So, to justify the work, companies will only contemplate it if the price of oil is going to remain high.

Speaking in June at a conference at London's Cass Business School, Dr Mamdouh Salameh, a consultant to the World Bank, argued that the tar sands did not have the potential to replace future shortfalls in conventional oil.

'It takes almost as much energy to mine, process, refine and upgrade the oil extracted from tar sand as the energy contained in the light oil produced. There is a small net energy gain,' he said. 'But it is estimated that processing a barrel of tar sand oil releases five to 10 times more greenhouse gases than a barrel of conventional oil.' Furthermore, processing requires huge amounts of fresh water and natural gas, both already in short supply, exacerbating the already enormous environmental impacts of the process. When the most environmentally damaging industry in the world's solution to its impending demise is a process even more damaging than the one currently wreaking havoc on the world's climate, you know we're in trouble.

Oil shale on the other hand is a misleading name, as it contains no oil but instead an organic material called kerogen, a precursor of petroleum. Getting this out requires that the shale be mined, crushed and refined, which also requires both fossil fuel energy and lots of money. To date, and despite decades of work by the oil companies, the cost of the work involved is still not commercially viable. As such, virtually no synthetic oil from kerogen is currently being produced and few expect this to change any time soon.

This leaves deep-water extraction (drilling for oil where the sea bed is often 7,000 metres or more below the surface). Up until recently, the low price of oil has made deep-water extraction economically unviable. However, the recent price rises, coupled with improvements in technology, have reduced the price of extraction, encouraging a few oil companies to look more favourably into the deep. But this is not for the faint-hearted, as platforms can cost upwards of \$1 billion to establish, so it is still really only available to the ultra-large companies who can stump up the initial capital necessary.

Given the IEA estimates that, to keep up with demand, the global oil and gas industry will have to spend over \$6 trillion by 2030, most of it on exploration and production, it's possible that these unconventional supplies may help to maintain world oil supply. But one fact is certain, it won't be cheap.

The last chance saloon – finding more oil

The only hope left for cheap oil, then, is that there is still a lot of it out there to be found. Once again, however, the signs are not good.

Tesco reported a \$9 million hike in the cost of producing its carrier bags as oil prices crashed through \$61 a barrel

Exxon staff themselves and they expect no contribution from oil shale even by 2030 and only about four million barrels per day from Canadian oil sands in that time

As well as casting doubt on the scale of the world's known oil reserves, the *Shell Global Scenarios to 2025* report charts the history of oil discoveries around the world, which can be seen to peak in the mid-1970s before beginning to decline. (According to ExxonMobil the actual date of discovery peak was 1963-64). We are now sliding down the far side of this decline; fewer discoveries were made last year than any year since 1952. By 2040, the Shell figures predict, there will be almost no new oil being discovered.

'While major new finds cannot be ruled out, recent statistics do provide worrisome signals... Discoveries only replaced some 45 per cent of production since 1999. In addition, the number of discoveries is increasing but discoveries are getting smaller in size,' said the report.

On top of this, earlier this year Shell stunned the City when it admitted that, over the past year, it had only found enough new reserves of oil to replace 15 – 25 per cent of its production in that time. In short, for every four barrels of oil sold, the company had found less than one new barrel to replace it.

Likewise, in March Chevron, the second-largest energy group in the US, also announced that its reserves replacement ratio had fallen to 18 per cent. Even BP and ExxonMobil – the biggest oil companies in Europe and the US – replaced just 89 per cent and 83 per cent respectively last year. This means that, while they may have enough oil to satisfy their customers' demands today, unless they find truly vast new reserves soon, they will not have enough oil to do so tomorrow.

The same is happening on a global scale. According to figures from one of the world's leading private oil consultancies, IHS Energy, over the last decade global consumption of oil has averaged about 26 billion barrels a year. During this time the average amount of new oil reserves found each year has been just 7.4 billion barrels.

And even if they do manage to find and produce all the oil from the bottom of the ocean, more and more analysts believe it will only be around another 70 billion barrels, enough for little more than two years of expensive oil at current rates of consumption. Hardly a reason to rejoice.

So, when will oil peak?

In truth, estimates vary. The United States Geological Survey says not for 30 years. The IEA

expects it to happen anywhere between 2013 and 2037. The London Energy Institute says 2008.

A report by the US Department of Energy on the military significance of America's own oil reserves last year, said: 'The disparity between increasing production and declining discoveries can have only one outcome: a practical supply limit will be reached and future supply to meet conventional oil demand will not be available.'

This event, the report said, is now inevitable. It continues: '[A range of experts] expect the peak will occur between 2003 and 2020. What is notable... is that none extend beyond the year 2020, suggesting the world may be facing shortfalls much sooner than expected.'

To date, perhaps the most authoritative analysis of this issue has been done by the internationally respected Energy Institute, based in London. Using data compiled from, among others, BP's own figures, this analysis compares three things: the increase in oil production from all major new projects due to come on line by 2012, the natural decline in production from existing reserves, and the expected growth in global oil demand.

Over each of the last few years, the production of oil from entire countries has peaked and fallen into decline, said Chris Skrebowski, who compiled the analysis for the Institute. 'Mexico is going over the edge, China may or may not be going over, Denmark has definitely gone over the top this year,' he said. 'If the 1970s saw the first and second world oil crises, what we are talking about now is the third, final, crisis. We should be worried. Time is short and we are not even at the point where we admit we have a problem.'

Just how short? The report's conclusion is grim. Global demand for oil could finally exceed supply as early as the winter of this year.

And then what?

According to those analysts working with Hubbert's model (see box on page 41), once oil production does hit a peak it can be expected to decline by between two and seven per cent a year.

The 1970s saw the first and second world oil crises. What we are talking about now is the third, and final, crisis



Realistically, no one knows how fast this decline will be – it could be faster. In the North Sea, where production peaked in 1999, the decline has been much quicker than expected; 10 per cent last year and over eight per cent the year before that.

As a result, Britain's own supplies of oil have been unable to meet national demand and the country has had to rely on more expensive imports. The price of oil has gone up.

Jeff Rubin, world markets chief economist at the CIBC international bank, believes prices will have to rise to as much as \$101 a barrel by 2010 just to suppress demand enough to keep it in line with struggling supply.

'Economists and bankers will deny this because it runs counter to their models of supply and demand,' he said. 'These say that higher prices bring more supply, but this is not economics, we are looking at a geological peak in world oil production. There will be no increase in production because the supplies of oil do not exist.'

Significantly, Rubin is not alone. In May, the US investment bank Goldman Sachs released a report arguing that oil markets had entered into a 'super-spike' period that could see prices reach as high as \$105 a barrel. Meanwhile on the futures markets, where contracts are agreed to buy and sell oil at agreed dates up to years in advance, traders are also increasingly beginning to bet on \$100 a barrel.

But don't just look to the future. The signs are already here. Global expenditure on oil has risen by over \$1 trillion since 2001, according to figures from the US investment group Oak Associates. Last year in the UK, domestic electricity and gas bills rose by about 20 per cent and the industry's leaders are promising 'significant double digit' price rises again this winter. And in June, Tesco reported a £9 million hike in the cost of producing its carrier bags as oil prices crashed through \$61 a barrel. Although the supermarket did not say so, many expect these costs to be passed on to its consumers through increased costs of other products. First petrol, then plastic bags, then the food within them. Life is about to get a lot more expensive.

Yet still nothing is being done to wean us off our addiction to oil.

In May the International Energy Agency prepared a report entitled *Saving Oil in a Hurry*. This laid out a range of emergency oil-saving measures that oil importing countries, such as the US, should implement if world supplies fall by as little as one to two million barrels a day – equivalent to the disruptions caused by the 2003 Iraq war, or Hurricane Katrina. These include reducing motorway speed limits by 25 per cent, shortening the working week, driving bans on certain days, free public transport and promoting car-pooling schemes. Elsewhere in the world some of these measures have already taken place. During May and June, the Philippines cut the working week for its civil servants to four days to reduce energy demand as part of desperate attempt to reduce 300,000 barrels a day of oil imports.

And yet the world remains totally unprepared. Or as Kelvin Beer, currently chairing a study by the World Energy Council into energy security, commented: 'Oil itself has been very lucky. It's had no competitors and there is no substitute. It's that good that you can tax it like crazy and people will still pay for it. The reason for that has been the internal combustion engine, the world economy is built on this invention and no one has attempted to replace it.'

■ Dan Box is a correspondent for the *Sunday Times*

THE END OF
OIL

...and its consequences for food,
climate and the economy

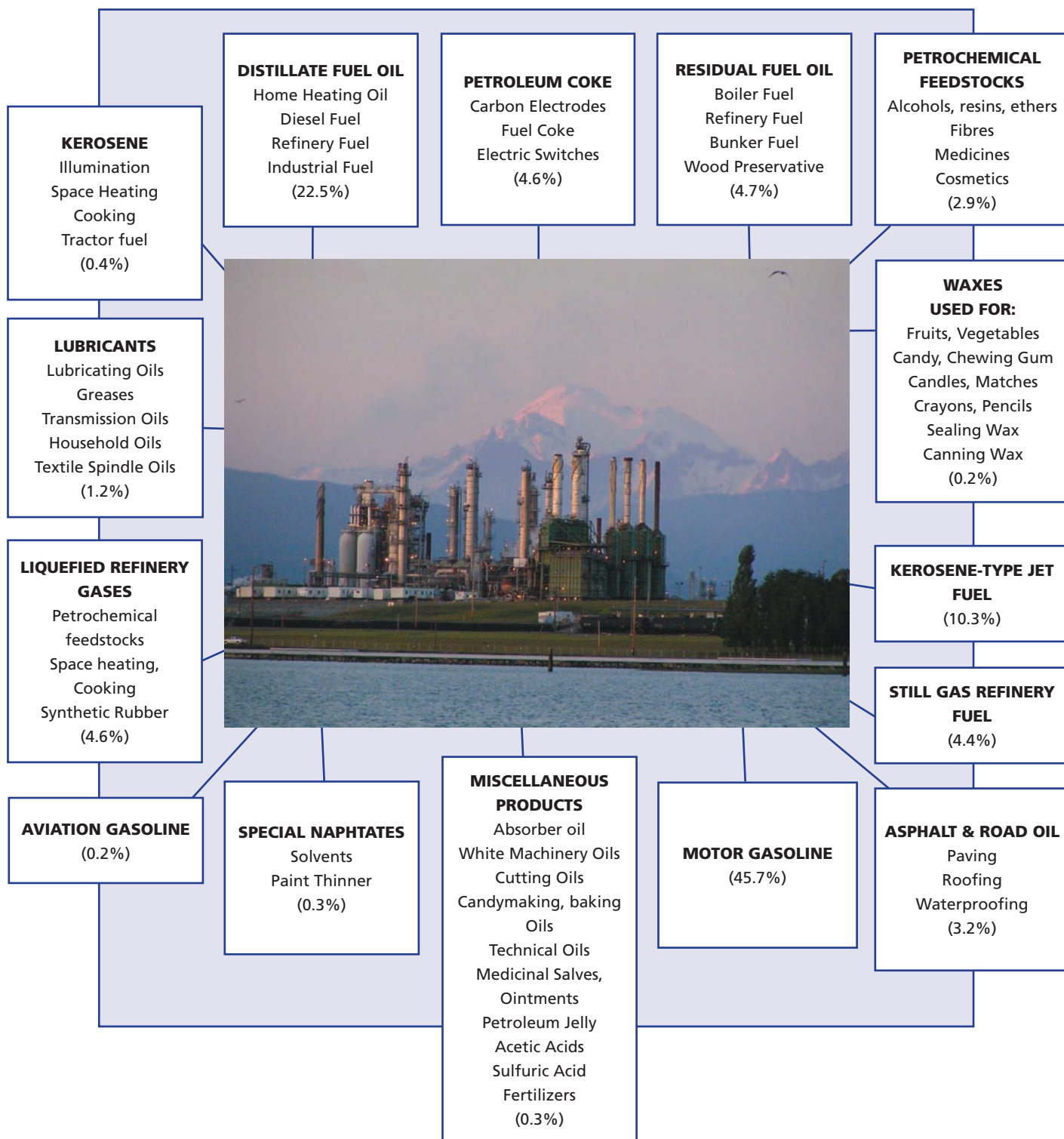
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OIL DEPENDENCE

As can be seen from the diagram below, there isn't an aspect of our lives that won't be affected by the rising oil price.



THE END OF CHEAP OIL THE CONSEQUENCES

Our lives are now so dependent on oil that it is impossible to conceive of a world without it. Before long, however, we will have no choice. The sooner we start planning for that reality, and changing the way we live, the better our chance of survival.

REPORT BY **DAN BOX, TULLY WAKEMAN AND JEREMY SMITH**

On September 9, 2000, a hastily assembled force of lorry drivers and farmers arrived at the gates of Shell's Stanlow petrol refinery near Ellesmere Port in Cheshire and threw their vehicles across the road, blocking the entrance to the plant. Protestors, led by farmers from St Asaph in North Wales, climbed into the cab of a tanker that had crossed a pavement to bypass the blockade. Police had to break up the ensuing struggle, before clearing the road.


The farmers were furious at the high prices they were paying for fuel, driven up by increasing taxes they said were forcing many out of business. They took their cue from France where, on August 28, French fishermen blockaded ports and within days won a reduction on fuel costs. Sensing a similar opportunity, French lorry drivers and farmers began blocking the refineries to protest at a 75 per cent increase in the price of diesel after a rise in world oil prices. At first the country's Prime Minister, Lionel Jospin, stood firm, but soon concessions were on the table.

Inside Stanlow, 60 drivers were trapped, unable to leave the refinery. As a result, 1.8 million litres of fuel destined for hundreds of petrol stations around the country went undelivered.

It did not take long for the impact to be felt.

Three days later, on September 12, ambulance services in the north-west called a halt to all non-emergency journeys and imposed 55mph speed limits on their fleet to conserve petrol. Staffordshire ambulance service said it had enough petrol left for 11 days. Manchester ambulance service set up emergency accommodation for its staff, for fear that without petrol they would be unable to get to work.

The blockades spread around the country, to the UK's main refineries and petrol terminals. As they did so, a rash of panic buying by motorists caused huge queues to spill out of petrol stations across the country, fouling the roads. Arguments broke out on station forecourts, where some had seen the price charged for fuel double, as drivers accused the owners of profiteering from price rises imposed in the name of preserving dwindling stocks. Bread queues formed and shelves were stripped bare at supermarkets as disruption to their supplies and more panic buying forced some chains, including Asda and Safeway, to introduce rationing. At some J Sainsbury stores shoppers were allowed only three loaves, six pints of milk and two bags of sugar each, while the company's chief executive, Sir Peter Davis, wrote to Tony Blair to warn that it could run out of food completely within days. At this point the cabinet office civil

A photograph of a highway interchange. At the top, a large blue sign with white text reads "The WEST Slough (Central & West) M 4 Reading, Windsor". Below the sign is a gantry with three sets of traffic lights, each with a blue downward-pointing arrow. The road below is a multi-lane highway with a metal guardrail. The left side of the road is empty, while the right side has a few cars, including a red car and a black car. The road curves to the right.

The WEST
Slough (Central & West) M 4
Reading, Windsor

The westbound carriageway of the M4 motorway, one of the main routes out of London, stands empty of cars shortly after rush hour September 13, 2000 as the effects of U.K. fuel shortages begin to show. Days of blockades have prevented fuel deliveries to petrol stations across the country, causing more than three quarters of the outlets to run dry.

emergency response team, Cobra, was meeting three times a day and the NHS had begun to cancel operations.

Its effects are an example of what happens when a country starts to run out of oil. By the time the protests subsided they had forced an unknown number of companies into bankruptcy and caused those that survived losses estimated at hundreds of millions of pounds.

Eating Oil

One thing the 2000 protests made abundantly clear is that when the price of oil starts to rise it will radically affect the way our food is produced, bought and consumed. The competitive edge which supermarkets currently enjoy is entirely the gift of cheap energy. Cheap energy enables companies to process food into many different forms – frozen veg, ready meals, cook-in sauces, breakfast cereals, tins of soup – many of which are hugely expensive in terms of energy for processing, packaging and transport between the stages of processing. The huge number of processed products gives rise to the wide ‘range’ of goods carried by supermarkets, which gives them a competitive edge over smaller, local stores. It also enables supermarkets and other big companies to dominate grocery distribution, since the economics of warehousing say that the wider the range you carry, the larger and more centralised warehouses become. Cheap energy has also affected consumer preferences: today most shoppers have cars and almost all have fridges and freezers: this means they can shop weekly, and prefer to use their car to carry the resulting bulk of shopping, which again suits the supermarkets. And today’s consumers feel time-poor but cash-rich, so they are willing to pay a bit more for more convenience food.

As energy prices rise, however, all those factors will quickly unravel. Consumers will start to shop more locally to save petrol, and start to shop daily rather than weekly because frequent powercuts and high electricity prices mean they can no longer use a freezer, perhaps not even a fridge. Many will be looking to buy original ingredients rather than processed foods, which will have become exorbitantly expensive. Supermarkets will seek to buy even more convenience shops, and start to run down their out-of-town superstores, but have to turn to local distributors and local producers and manufacturers, which undermines their buying power and leaves them competing on more equal terms with local retailers. The cost of moving heavy items like milk, beer and fizzy drinks becomes a major factor in those items’ cost: regional dairies, brewers and bottlers spring up, using returnable bottles to save the energy cost of

recycling, and easily out-compete their national rivals.

When the country’s food distribution network begins the shift from international to local, the lorries transporting our food, which currently make up a third of all freight on the roads, will start to disappear. Nor will they be the only change to our transport system, which today accounts for over one-third of the UK’s final energy use. As we reach the end of cheap energy, air transport will surely be one of the first sectors to disappear – both holidays in Malaga and mange tout from Kenya are luxuries that we will quickly trim from overstretched domestic budgets.

Likewise car transport has grown exponentially over the years because the cost of running a car has fallen while incomes have grown. People have been able to afford the luxury of living in one place, working in another, driving their children to school in another and shopping in another. As the era of cheap oil draws to an end, this trend will reverse. Families will increasingly look to save money by living, working, shopping and schooling the children in the same place. Eventually they will find they are using the car so little that they will not bother to replace it when it grows old: car ownership will decline markedly.

Of course it’s not just our ways of living that will change; those people who make their money from the various vanishing sectors will also see their means of income vanish. Airlines, aircraft manufacturers and travel agencies will be among the first to go. Car manufacturers, garages and road builders will not be far behind. Supermarkets will be another early casualty, as will many of the global food businesses that serve them. As these big corporations fall off the radar, the financial services sector that exists to service them will also start to collapse. Since currently 30 per cent of the UK’s gross domestic product comes from financial services, this will have a huge impact on our economy. Other sectors that piggyback on big corporations such as marketing, advertising, and computer services, will also implode.

Internationally, a number of ‘bubbles’ will be burst. The US’ massive balance of payments deficit will continue to stretch as Americans spend more and more on importing oil, until eventually their creditors (mainly in Asia) pull the plug, and the dollar collapses. The UK’s and US’s over-inflated share and property prices will collapse as belts tighten and big corporations go bankrupt. Banks fold as borrowers default on loans.

The very notion of growth itself belongs to the era of cheap oil. Growth in gross domestic product (GDP) has always depended on the increasing specialisation of labour, first between

HOW MUCH OIL IS THERE IN A BOTTLE OF TOMATO KETCHUP?

A study by the Swedish Institute for Food and Biotechnology has analysed almost everything that goes into making a bottle of tomato ketchup.



The tomatoes were grown in Italy in fields treated with fertiliser and pesticides (both based on products made from refined oil)...



...The farm machinery that ploughed the fields, sprayed the crops and transported them to the packing house were all also run on oil...



...Once picked the tomatoes were then processed into paste, using machines whose electricity was provided by fossil fuel power stations...



...In Sweden the paste was mixed with the other ingredients (whose provenance was not included in the analysis, but would only serve to accentuate the reliance on oil)...



...Once filled with paste the bags were stored in steel barrels, which were then shipped back north to Sweden...



...The paste was then packaged in bags that had been produced from refined oil products and shipped (powered by oil) from the Netherlands to Italy...



...The finished ketchup was then transferred to plastic bottles. These were produced either in the UK or Sweden yet comprise of materials (five different types of oil-based plastic and adhesive) transported from Japan, Italy, Belgium, the USA and Denmark.

In all, the study found, there were 52 transport and/or production processes needed to combine the various products together to make a single bottle of sauce. This was not including the crude oil being brought from whenever it first came from, the process of refining the oil, the resources involved in processing and transporting the sugar, salt, vinegar and other ingredients to Sweden, and the journey made (probably by car) to buy the product from the supermarket and return it home.

individuals and eventually between countries, which has depended on cheap energy. Growth in GDP has always been mirrored by growth in energy use (recent claims by western economies to have 'decoupled' GDP growth from energy growth merely reflects the fact that the west has exported energy-intensive activities to other countries, not that those activities have ceased to grow). And without growth, the notion of charging interest

Airlines and travel agencies will be among the first to go. Car manufacturers, garages and road builders will not be far behind



A Belgian cyclist enjoys an open city road free of automobile traffic during a blockade by Belgian truckers in Brussels September 13, 2000. The truckers blocked major avenues in the capital as well as highways leading into it on their fourth day of protest against high fuel prices.

on money is also defunct – you can only charge interest if you expect there to be more money around next year than there is this year.

The collapse of the economy will be felt most in financial centres like London. With no fields on which to grow or graze, these giant cities need to buy in food and other goods, which they pay for by ‘exporting’ services like financial services, tourism and government. When financial services and tourism collapse, so will London’s income. (Government will probably also shrink rapidly, and become more localised). Meanwhile, the costs of feeding London, already unusually high, will become much higher, because of the need to transport food into the city. It seems inevitable that cities like London will shrink rapidly as the era of cheap oil comes to an end.

But where will Londoners go? Our governments may love building on every green space they can find, but soon we will need whatever land remains to grow our food. The reality is that there are

simply too many people in the UK, and the world as whole, for our planet’s dwindling resources to sustain. Before the industrial revolution there were around one billion people on the planet. Tied closely to the improved yields that chemically based farming brought humanity, is the massive surge in population that now sees us stand at almost seven billion and growing. We already use up 40 per cent of the available photosynthetic energy on this planet to feed just our own species. However, as David Pimentel reported in 1996: ‘World cropland per capita has been declining and is now only 0.27 hectare (ha) per capita; in China only 0.08 ha now is available. This is only 15 per cent of the 0.5 ha per capita considered minimal for a diverse diet similar to that of the US and Europe.’ Having analysed the various options available, he and his co-authors conclude that: ‘Several studies have confirmed that to maintain a relatively high standard of living, the optimum population should be less than 200 million for

the US and less than two billion for the world.' On the other hand, if the population were to reach predicted figures of 12 billion within the next half century, there would be less than 0.15 ha per capita in just 40 years. What is clear is the world's population, at its current levels, cannot be sustained.

So what can we do?

We need to return to localised systems of production and consumption. A UK study found that buying local food from a farmers market reduced the greenhouse-gas emissions associated with distribution by a factor of 650. For a box scheme the impact was even greater. Likewise a Japanese environmental group found that if Japanese families shifted from imported produce to local, it would be equivalent to cutting household energy use by 20 per cent.

Localising production also maximises the amount of energy we get from our food as opposed to the amount we expend producing it. For example, to fly one unit of carrot energy from South Africa to the UK takes 66 units of energy in the form of airplane fuel. For lettuce from the US it is a staggering 127 calories of fuel for every calorie of lettuce.

As well as localising food production, we have to move away from a system of farming based on inputs derived from fossil fuels to one based on organic principles.

A UK study comparing organic and conventional livestock, dairy, vegetable and arable systems found that producing our food organically used 42 per cent less energy, mainly as a result of using little or no fertiliser and pesticide, which between them account for half of the energy input in the growing of non-organic potato and winter wheat and as much as 80 per cent for some vegetables. Likewise organic milk production can be as much as five times more energy efficient than its non-organic counterpart. Currently, however, all these gains are being cancelled out by the fact that over three-quarters of organic produce sold in the UK is imported, while only two per cent of the UK's farm land is organically managed.

While it is clear that we need to move towards a locally based organic farming system, this shift will be far from easy. As well as depleting the world's fossil fuel reserves, industrial agriculture had ripped out the heart of our rural communities, such that whereas 75 per cent of Europe's population was involved in agriculture before the industrial revolution, now it is less than 10 per cent. In the US it is even worse – only two per cent of the population are now involved in farming.

As people have departed the fields, so too has

THE REAL COSTS OF CHEAP FOOD

...IN THE UK?

■ If you buy a basket of fruit in a UK supermarket today, only five per cent of it will have been grown in the UK. The value of UK food, feed and drink imports in 1999 was over £17 billion, and those imports were travelling 50 per cent further to reach our plates than 20 years before. UK food imports require 1.6 billion litres of fuel and cause 4.1 million tonnes of carbon dioxide emissions.

■ Over three-quarters of organic produce sold in the UK is imported, while only two per cent of the UK's farm land is organically managed.

■ To fly one unit of carrot energy from South Africa to the UK takes 66 units of energy in the form of airplane fuel. For lettuce from the US it is worse, at 127 calories of fuel for every calorie of lettuce.

■ Now add in all the oil used in producing, processing and packaging, and it's estimated that for every calorie of energy used in actually growing our food, five more are used for processing, storage and distribution.

■ The food system is responsible for perhaps one-sixth of the UK's final energy consumption. Around one-quarter of that amount is used in agriculture and its inputs (including fertilisers), about half in processing and distribution, and the final quarter in the home to refrigerate and cook the food.

...WORLDWIDE?

In the US, agriculture is directly responsible for over 10 per cent of all national energy (mostly oil) consumption.

■ Over 400 gallons of oil equivalent are expended to feed each American each year. About a third of that amount goes toward

fertilizer production, 20 per cent to operate machinery, 16 per cent for transportation, 13 per cent for irrigation, eight per cent for livestock raising, (not including the feed), and five per cent for pesticide production. This does not include energy costs for packaging, refrigeration, transportation to retailers, or cooking.

■ Trucks move most of the world's food, even though trucking is 10 times more energy-intensive than moving food by train or barge. Air transport, the fastest growing sector of food haulage, uses 60 times the energy cost of sea transport.

■ Annual world pesticide (derived from oil) use is around 2.5 million metric tons, of which 0.6 million metric tons are used in North America. Since 1945, pesticide use in the US has grown 33-fold, yet the country has lost more and more crops to pests as they become resistant.

■ Processed foods make up 75 per cent of the value of global food sales. The energy costs involved are vast – a 1lb box of cereal may require over 7,000 kilocalories of energy to produce, yet provide only 1,100 kilocalories of energy as food.

■ As well as depleting the world's fossil fuel reserves, industrial agriculture has ripped out the heart of our rural communities, such that whereas 75 per cent of Europe's population was involved in agriculture before the industrial revolution, now it is less than 10 per cent. In the US it is even worse – only two per cent of the population are now involved in farming.

their knowledge. It takes far more skill to farm organically than it does to follow the instructions on the back of a pack of Monsanto pesticide. Yet because local, organic farming is more labour intensive than its industrial equivalent, we are going to need increasing numbers of 'skilled' people to return to the land if we are to come close to feeding the world's population.

The need for such a return to local agriculture also makes a nonsense of the G8's recent bold proclamations that it is going to help Africa by giving it the chance to export to the rest of the world. For how long? Who in the UK will pay £7 for a punnet of Kenyan green beans? The same goes for Fair Trade. While the short term benefits: steady demand, decent prices and fair wages are a lifeline to many farmers and their communities now, is encouraging farmers to work for export markets rather than for internal ones going to

do more harm than good when oil makes export economically unviable? Wouldn't it be better to help strengthen internal markets?

And finally

It has become a truism that we go to war for oil oil, but while the concept of peak oil and the relationship between oil and the entirety of our everyday lives is not fully understood, people still see this as some abstract geopolitical game played by corporations and politicians with little impact upon their own lives except at the petrol pump.

This disconnect between the reality of fuel price rises and their impact was shown during the 2000 fuel protests. While the head of Sainsbury's Peter Davies' dire warning that if they carried on for more than three days his stores would be out of food, should have been a warning of our food system's reliance on oil, the end result was one that has made matters worse.

Six years earlier the Royal Commission on Environmental Pollution had advised that fuel duty be increased every year so as to double the price of fuel, relative to the prices of other goods, by 2005, a plan that would require a nine per cent increase in duty each year. This would have made long distance transport of food less economically attractive, and had the effect of boosting local economies and protecting the environment.

Yet what did the government do in the wake of the 2000 protests? It dropped the fuel duty escalator. Long distance transport remained cheap, excess unsustainable consumption resumed.

We are now at a point in time where we, as individuals, are faced with two stark choices. Either we carry on as we are. We keep going to the supermarket, buying imported food and spurning our local producers, growers and suppliers. The supermarkets get stronger. The distances get longer. The oil runs out quicker. And we are totally unprepared for the inevitable collapse of this system. After all, we haven't cooked a proper meal in years, let alone worked out who or where our nearest farmer is.

Or, we turn our back on the supermarketisation of our world. We go to farmers markets, sign up for box schemes, grow our own food. The price of oil continues to rise but this time as the shelves empty in the supermarket and the fights break out over the last chicken tikka massala, we, and the local community we have helped to save and been saved by, are better prepared for a world without oil.

■ Tully Wakeman is coordinator of East Anglia Food Link. Jeremy Smith is the deputy editor of the Ecologist.

CUBA: RUNNING ON (ALMOST) EMPTY

An example of what can be achieved, admittedly on a much smaller scale than would be needed in the UK, can be found in Cuba. In the late 1980s, farmers in Cuba were highly reliant on cheap fuels and petrochemicals imported from the Soviet Union, using more agrochemicals per acre than their American counterparts. In 1990, as the Soviet empire collapsed, Cuba lost those imports and faced an agricultural crisis. The population lost 20 pounds on average and malnutrition was nearly universal, especially among young children. The Cuban GDP fell by 85 per cent and inhabitants of the island nation experienced a substantial decline in their material standard of living. Cuban authorities responded by breaking up large state-owned farms, offering land to farming families, and encouraging the formation of small agricultural co-ops. Cuban farmers began employing oxen as a replacement for the tractors they could no longer afford to fuel. Cuban scientists began investigating biological methods of pest control and soil fertility enhancement. The government sponsored widespread education in organic food production, and the Cuban people adopted a mostly vegetarian diet out of necessity. Salaries for agricultural workers were raised, in many cases to above the levels



of urban office workers. Urban gardens were encouraged in parking lots and on public lands, and thousands of rooftop gardens appeared. Small food animals such as chickens and rabbits began to be raised on rooftops as well. As a result of these efforts, Cuba was able to avoid what might otherwise have been a severe famine. Today the nation is changing from an industrial to an agrarian society. While energy use in Cuba is now one-twentieth of that in the US, the economy is growing at a slow but steady rate. Food production has returned to 90 per cent of its pre-crisis levels.

ESSENTIAL READING

For those of you not yet convinced that we are at the end of cheap oil... or who think peak oil is not due for a few decades... or who aren't worried because technology will appear to sustain our current lifestyles ... take your pick from the following books and websites:

BOOKS

Blood & Oil

How America's thirst for petrol is killing us

By Michael Klare
Penguin, 2004, £7.99

Crossing the Rubicon

The decline of the American empire at the end of the age of oil

By Michael Ruppert
New Society, 2005, US \$19.95

High Noon for Natural Gas

The new energy crisis

By Julian Darley
Chelsea Green, 2004, US \$18

Hubbert's Peak

The impending world oil shortage

By Kenneth S Deffeyes
Princeton University Press, 2001, £10.95

Island Planet

A survival guide for the end of the fossil fuel world

(paperback)
By Matthew Henley
Publish America, 2005, US \$19.95

It's the Crude, Dude

War, big oil and the fight for the planet

By Linda Mcquiga
Anchor Canada, 2005, Canadian \$22

Oil Crisis

By Colin J Campbell
Multi Science Publishing, 2005, £23.50

Powerdown

Options and actions for a post-carbon world

By Richard Heinberg
Clairview Books, 2004, £10.95

The End of Oil - The decline of the petroleum economy and the rise of a new energy order

By Paul Roberts
Bloomsbury, 2004, £17.99 (Hbk)

The Growth Illusion

How economic growth has enriched the few, impoverished the many, and endangered the planet

By Richard Douthwaite
Green Books, 1999, £12.95

The Last Hours of Ancient Sunlight

By Thom Hartmann
Hodder & Mobius, 2001, £8.99

The Long Emergency

Surviving the converging catastrophes of the twenty-first century

By James Howard Kunstler
Atlantic Books, 2005, £12.99

The Party's Over

Oil, war, and the fate of industrial societies

By Richard Heinberg
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The coming Saudi oil shock and the world economy

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WEBSITES

www.dieoff.org (comprehensive directory of articles on oil peak)

www.drydipstick.com (a peak oil metadirectory)

www.energybulletin.net (a clearing house for current information on the peak in global energy supply)

www.globalpublicmedia.com (public service broadcasting for a post-carbon world)

www.odac-info.org (an independent, UK-registered educational charity working to promote better understanding of the world's oil-depletion problem)

www.oilcast.com (energy news site)

www.oilcrisis.com (comprehensive site on the coming global oil crisis)

www.peakoil.com (up-to-the-minute news and message boards)

www.peakoil.ie (home site for Dr Colin Campbell, one of the kings of peak oil)

www.postcarbon.org (educational institution and think tank that explores in theory and practice what cultures, civilisation, governance and economies might look like in a post-carbon world)

www.powerswitch.org.uk (UK campaigning website)

www.322.org.uk (peak oil, global warming and nutrition)



Nature

Lessons from

BY ANTHONY WALL

Episode 1 – Killer Bees

Frank Garcia had been working hard – too hard – in the boiling Arizona sun. He ached all over and felt every day of his 71 years. From now on, Frank vowed, he'd take life easier.

Home at last, he flopped gratefully into a chair on the porch and relaxed in the cooling shade. Half asleep and unconcerned, Frank noticed a small swarm of bees nearby. One landed on him. Instinctively, he swatted it.

And that was the beginning of the end of Frank Garcia. For the bee was no ordinary honey bee. It was a killer – and as it died it sent a signal to the hive, triggering a mass attack.

Within seconds, Frank was engulfed in a swarm of stinging killer bees. They came at him by the thousand, wave upon wave, the rising pitch of their wings sounded like a revving engine.

Frank's neighbour Gary Elam takes up the story. 'I heard muffled yells, then hammering on the door. My wife Mary answered it and screamed. I hurried over. It was terrible... like Frank was buried by bees, staggering under the weight of them. I couldn't just leave him there. But if I let him – them – into the house...'

Gary's daughter, Mary Jo, rushed upstairs, put on her wedding veil and bravely ventured outside. 'Must save Mr Garcia.' She grabbed a hose, sprayed the air around him, and tried to disperse the cloud of besieging bees. But it was in vain – they would not be diverted from their deadly mission.

Meanwhile, Mary Jo's mother had phoned the Emergency Services. Paramedic Dave Cadena and his partner arrived in their ambulance soon after.

'Somehow we managed to get the poor guy into the ambulance. My partner checked for a pulse. I opened the patient's mouth and – God, I'll never forget the sight – his mouth was full of bees – a hundred at least. And they were coming out of

his nose, ears...'

'We reached the hospital too late. He'd gone. The doctor said not to blame ourselves, said nobody could survive so many stings. The autopsy found bees in Mr Garcia's stomach.'

This 1997 incident, while exceptionally gruesome, is far from unique. More than 1,000 people, as well as uncounted animals, have died in similar attacks.

Killer bees – properly known as Africanised honey bees – seem set to take over the Americas.

How did these fearsome intruders get there? Can they be stopped?

The saga started in Brazil with a campaign to boost honey production. Imported European bees, perfectly suited to their native environment, were faring less well in Brazil's tropical humidity. For decades, beekeepers had complained about low yields of honey. Surely something could be done to 'perk up' the underperforming bees...?

Enter geneticist Warwick Kerr. In 1956, at the Government's request, he travelled to South Africa and brought back 63 queen bees. The aim was to mate them with European stock to create a hybrid that would combine the best features of both breeds. Kerr knew the risks. African Honey Bees are notoriously vicious and volatile, but he believed that their fiery nature could be diluted by an injection of European docility.

Experiments began at a quarantined research station. And, surprisingly soon, Kerr was able to announce a breakthrough: the first generation of hybrids.

But then the (inevitable?) accident happened. Some Africanised queens, along with platoons



of workers, escaped. Not even Kerr foresaw the consequences.

African Bees have honed their lethal skills over millions of years – a defence mechanism against honey-thieving predators, including man. Super-sensitive to any perceived threat, the bees respond with terrifying suddenness and in overwhelming numbers. They also possess phenomenal reproductive powers. The hybrids inherited all these traits.

And what of those escapees? Before long, Brazilian peasants were reporting livestock stung to death. Human fatalities followed.

Killer bees were on the rampage. Irresistibly, year by year, country by country, the colonising insects surged through South America.

Then, forever seeking new lands to conquer, the bees veered north, to Central America.

Next, Mexico fell (with appallingly high losses: 400 lives so far).

Finally, in 1990, the relentless squadrons swept into US territory. Texas, Arizona, Nevada, California... each in turn would face invasion by killer bees.

TV and press provided graphic coverage.

One news bulletin featured an Alsatian dog named Baron. His owner, Natalie Leseburg, pursued by frenzied bees, had fled indoors. Only then did she realise that Baron was still outside. Later, following a trail of blood, she found Baron's body. His face was barely recognisable, scraped red and raw on a wall as he'd frantically tried to get the bees off him. (Five hundred stings are equivalent to a rattlesnake bite; 800 will kill the average person. Baron had suffered more than 2,500 stings.)

Anxious communities became angry and sought ways to fight back. Kill the killers!

Today, teams of 'beebusters' are dedicated to doing just that. It's war, but can they win? In Tucson, Arizona, men such as Brad Bartlett take each battle as it comes. Sometimes the bees make an easy target. Out in the open, a homeless colony – inactive and 'innocent' – hangs like a gigantic cluster of black and yellow grapes. Brad hits hard and fast with a jet of soapy water. 'Suffocates 'em,' he says.

But when the bees have a nest to defend (perhaps under someone's roof), their ferocity is full throttle.

'R-e-a-l mean,' says Brad, 'but me and the guys can be meaner.'

Towns and cities, especially in arid terrain, act as a magnet to migrating swarms. Urban

conditions offer everything a bee could want: ample nesting sites, plentiful pools of water, all manner of blooming plants for the nectar and pollen needed in honey-making.

Even Los Angeles has been forced to play host to these 'horror movie' aliens. Beebusters there handle 6,000 calls a year from panicked citizens – even film stars in Beverly Hills whose gated enclaves are no protection against rogue bee interlopers.

If Africanised honey bees are a menace to humans, they cause still greater havoc among the domestic bee population – mild mannered creatures, originally from Europe. The aggressive newcomers have swamped the peaceful residents and bullied them into submission.

Once killer bees infiltrate a hive, the occupants soon succumb. An Africanised queen lays about 3,000 eggs a day, and her numerous young mature earlier than their European counterparts. Rival queens are ruthlessly eliminated. In no time, a benign community can become belligerent. As the Africanised bees proliferate, they divide and spread out to form fresh colonies, occupying more and more territory.

Now, because of constant interbreeding, in large tracts of America all honey bees are starting to show a savage streak.

Bad news for honey producers, but worse perhaps for farmers.

Bees pollinate crops worth \$20 billion a year, one third of the country's food supply. Amiable bees, trustworthy allies. At least they were...

Ken Letsky worries – a lot – about the future. His mobile pollination units (trucks each containing 15 million bees) criss-cross Texas to perform a vital service. 'What if my bees were Africanised? Could I control them?'

Ken's concerns are shared by other beekeepers, but they haven't abandoned hope. They now know how to remove a killer queen from the hive, so restoring comparative calm. And scientists report real progress in the quest to breed a 'better' bee. Meanwhile, though, feral colonies continue to expand, as wild or wilder than ever.

Whatever may lie ahead, one thing is certain: America must learn to live and work with Africanised honey bees.

Could these death-dealing invaders come to Britain one day? No, says the Natural History Museum, only if they were introduced. And even then, they wouldn't survive our winters... unless, of course, the climate changed.





GREENING THE BLUES

If you split post-operative patients into two groups, giving one a view of trees and the other a view of a brick wall, the group that was exposed to the trees will need fewer painkillers, develop fewer complications and will check themselves out of hospital more quickly than the group with the urban view. Isn't it time to accept that some of the distress we currently feel is tied to the world beyond the consulting room, to this planet of ours that's become so stripped and bare? **BY EMILY WHITE**

Despite the bright ads for Zoloft and Paxil, depression remains taboo. It's the emotion that shouldn't be mentioned, the all-encompassing feeling we're not supposed to have. In a society that prizes

PHOTOGRAPH BY CORBIS



flawlessness, and that relentlessly assures us that all our needs are being met, personal pain in the form of depression emerges as a failing, as an emotional mistake we have to correct.

The idea of a depression as a problem in need of a cure is driven home by

Dr Peter Kramer, the best-selling writer and psychiatrist, in his new book, *Against Depression*. In it, Kramer emphasises that depression has nothing to tell us about ourselves or the world we live in. For Kramer, depression is 'illness merely', much like psoriasis or diabetes, and if

you fail to understand this, it's because your thinking is badly out of date. You don't realise that there's now evidence of a 'physical substrate' to depression – abnormalities in the hippocampus and prefrontal cortex – and that this pathology is incompatible with meaning.

DEPRESSION

If you wouldn't listen to syphilis, Kramer asks in a cute aside, why would you do so with depression?

Kramer's attempt to shoe-horn depression into the physical illness camp could be dismissed as more public relations for the drug industry – if depression is a disease, then treatment becomes both a duty and a right – but his message is more complex and troubling than that. Kramer raises the possibility of a depression-free future – one achieved through an as-yet unrealisable mix of medication and genetic engineering – and he urges us towards this goal with the zealotry of a southern preacher. He never once stops to ask whether, in stamping out depression, we might be losing one of the strongest messages we have about our current, unstable relationship with the earth.

Everyone knows that depression rates are high; most of us know someone who's been or is on antidepressants. Kramer cites an estimated clinical depression rate in the United States of six to seven per cent of the population per year, and even this figure seems low. One US study found depression rates for children to be hovering between seven and 14 per cent and, at some American colleges, at least a quarter of the student body will be taking anti-depressants before graduation.

Since he's positioning depression as a disease, Kramer needs to argue that the illness isn't specific to our era. To this end, he includes an odd fictional vignette featuring depressive hunter-gatherers on a far-off savanna. However, a recent study of

40,000 people in North America, the Middle East, Europe, and Asia showed an overall increase in the rates of major depression over time and across all countries, a finding that confirms what most people intuitively know: that we're more depressed than we used to be, and that clinical depression – with its exhaustion, monotony, and fearfulness – has become the signature ailment of life in an environmentally-stressed world.

In touch with nature

The idea that ecological strain might translate into psychic distress is something that forward-thinking biologists and psychologists have been trying to point out for the past two decades. EO Wilson coined the word 'biophilia' to describe our innate affiliation with the natural world, and he noted that having been 'totally and intimately involved with other

organisms' for over 99 per cent of our history, it would be extraordinary to think of the human need for nature as simply disappearing within a few generations.

We know that we have sharp physical and psychological reactions to images of environmental loss – we experience this every time we open the paper to see a photo of a snake choking on plastic, or a gull with a misshapen beak – but research on the connection is lacking. Conservationists such as Wilson have spent years arguing that we're allowing the world to lose biodiversity without understanding the extent of our psychic and emotional need for what's being lost. Letting this happen is a lot like starting an experiment by burning down the lab. Once something is lost, it's lost. And once that something – either a brightly coloured bird or miles of undeveloped land – is gone, it becomes impossible for us to understand the positive ways in

which it might have affected us.

The result, which University of Washington psychologist Peter Kahn calls 'environmental amnesia', can leave us with a lack of flourishing or stunted emotional development that we don't even recognise as unnatural. 'It's like we're animals in a zoo,' says Kahn. 'It's not that we're not surviving. You know, animals in a zoo often adapt and they live long lives. And, surprisingly, if you open the gates, they often prefer the zoo, because that's where they've been born. But that doesn't mean you have a full account of what an animal's life can be like, if it's fully thriving as the species can.'

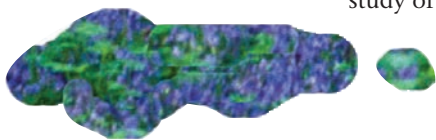
Nature and psychological health

Dr Aaron Katcher, professor emeritus of psychiatry at the University of Pennsylvania, is one of the only psychiatrists in North America to study the relationship between natural forms and psychological health. His work – with autistic children, the elderly, and patients suffering from organic brain disease – has demonstrated that the introduction of animals into a school or clinical setting will lead to improved attention, increased laughter, more speech, improved sociability, and decreased aggression, even among the most withdrawn. 'We've been chasing them for four million years,' Katcher says bluntly, referring to the strong response animals trigger in us. 'In the course of those four million years, I think our brains have been programmed to pay close attention to animals and nature. Our survival depended on it.'

When animals and nature are taken away, the result, according to Katcher, is 'a psychic constriction, a lack of richness'. Katcher notes that our current lack of involvement with the natural world is historically unprecedented, and that we don't know what the results of our experiment in denuding nature are going to be. We might be psychologically fine in a world stripped of biological diversity, or 'the results might be more serious than we think'. Katcher is especially concerned about the huge number of children being raised without rich contact with the natural world. 'These are children who've lost something, but don't know they've lost it – children who are inured to their



Clinical depression has become the signature ailment of life in an environmentally-stressed world



losses. No one is looking at the effect on their emotional lives.'

And, unless our priorities change, no one is going to be investigating these matters for some time to come. Funding for psychiatry research is already being directed towards studies that accept the medical model. Kramer notes that, by the 1990s, 'every research dollar' was being funneled in this direction – and the prospect of a drug cure will start to seem even more alluring as depression and disability rates climb upwards. By 2020, for instance, when the WHO predicts that depression will be second only to heart disease as a cause of disability, many people will be clamouring for a 'cure'. But while the medical model might nudge us towards pharmaceutical treatments and other interventions, it fails to take account of the ways in which our very physiology is affected by nature.

Dr Robert Ulrich, a planner and environmental psychologist at Texas A & M University, has shown that nature restores us, both physically and mentally. Some of us still intuitively understand this: when distressed we might reach out for nature, either grabbing the cat for a cuddle or heading to a nearby park to relax. What Ulrich has done is prove that the improved moods we experience at such times are consistent and real. In study after study, Ulrich has shown that when exposed to pictures of natural settings, people's blood pressure drops, their heart rate falls, and muscles relax. Emotionally, people report feeling less stressed and anxious, less fearful, less aggressive, more focused, more alert, and better able to concentrate. Ulrich has also shown that if you split post-operative patients into two groups, giving one a view of trees and the other a view of a brick wall, the group that was exposed to the trees will need fewer painkillers, develop fewer complications, and will check themselves out of hospital more quickly than the group with the urban view. And in a long-term study that looked at which pieces of wall-art were being destroyed by psychiatric patients, researchers found that while patients attacked the abstract art, not once in 15 years had a patient destroyed a picture of a natural scene.

Since we don't yet understand the

extent of our emotional and physical ties to the natural world, Ulrich suggests that it would be sensible to hang on to the few wild places we have left. But, despite the work and urgings of a few smart researchers, conservation is not part of the picture when it comes to thinking about our mental health. Many of us take walks when we're blue – a study of college students showed that 75 per cent sought out natural settings when stressed or depressed – but the direct healing experiences we have in nature aren't being translated into research or action. Instead of studying the links between depression and ecological degradation, we're encouraged to see depression as an internal and almost secretive matter: as something to be discussed, in private, with a clinician, and then treated, again in private, with tranquilisers and SSRIs.

To suggest that rising rates of depression might be tied to environmental losses is not to deny or trivialise pharmaceutical treatment: pills can save lives, and they can smooth over some of depression's most ragged edges. But too heavy an emphasis on medication can make depression seem like a strictly internal event: it's hard to swallow a pill every night and not come to believe – with a greater or lesser degree of certainty – that you alone are the source of the problem under treatment. While personal factors play an important role in depression, we need to broaden the lens and start to recognise that losses in the natural world can make us depressed as well.

The restorative power of nature

'If you read any novel of the 19th century,' says Aaron Katcher, 'there is such a thing as "missing your country"'. It was accepted that people would become

depressed when they were taken away from their countryside, and that it was natural to mourn a lack of contact with the paysage you've been raised with.' In our rush towards a medicalised model, we've lost this idea of depression as a legitimate response to the loss of places we need to be joyful. Recognising that depression can filter in from outside – from the paving of fields and photos of frogs with too many legs, from endless messages about how we fail to measure up, from exhausted friends, the glare of headlights, polluted air, and the constant low-grade hum of engines – is not positioning yourself somehow 'for depression'. It's simply accepting that some of the distress we currently feel is tied to the world beyond the consulting room, to this planet of ours that's become so stripped and bare.



The World Health Organisation predicts that by 2020 depression will be second only to heart disease as a cause of disability

I learned this first-hand, after being transferred from a law firm in downtown Toronto to a government office in Iqaluit, on the southern edge of Baffin Island in the eastern Arctic. I arrived with SSRIs and with the conventional explanations about my depression, about it being caused by neurotransmitters and by my inability to express myself. Since the sun never set in Iqaluit, I was able to hike for hours every day, and I spent month after month fiddling around on the tundra, taking pictures of wildflowers and jumping from rock to rock across clear streams. As time went on, I noticed that I was less distressed and less anxious, more sure of myself and more

interested in the world around me. My improved mood wasn't simply the result of getting more exercise. It was that the landscape around me was so vibrant and solid that I began to feel that way as well.

When I came back to Toronto, it was as though a piece of film had been tacked to the front of my glasses: the world around me felt duller, and I felt further away from it. But there was nothing in mainstream culture to help me understand this emotional flattening. Instead, I saw ads for anti-depressants and books such as Kramer's, all of which were eager to assure me that the distress I'd experienced – the jumpy emptiness, the nights spent pacing the floor and the days spent half-asleep – was the result of illness, a disease like diabetes, and was unconnected to the rushed and paved place I'd lived in for so long.

It's easy to criticise Kramer and the slightly daffy, half-baked culture he's tapped into. Anyone who writes 300 pages about an affliction he's never experienced is setting himself up as a target. But Kramer is able to do this precisely because he's got the ammunition. He can point to countless studies about drugs and neurology, while someone trying to explore the links between mood and the environment is faced with a stack of little used, decade-old textbooks. It's as though our culture has so trivialised the natural world that we no longer realise how important it is. Compared with medication and the possibility of genetic splicing, fields and forests seem insignificant; we don't even bother to study their effect on us.

Understanding the link

We need to start understanding the extent to which our minds are linked to the natural world, and we need to do it now, before more biodiversity disappears. There's no money for drug companies to make from such an approach to depression, but it's one that would benefit both us and the planet. Recognising that not only our physical health, but also our mental and emotional health are tied to healthy ecosystems would give us a stronger incentive to save wild places. It would also help us situate depression in a broader cultural context, giving us a better understanding of the affliction

and possibly opening up new methods of treatment.

'The time to interrupt the illness is yesterday,' proclaims Kramer in *Against Depression*; he wants us all to take up

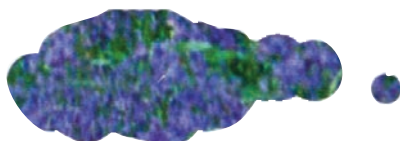
Our culture has so trivialised the natural world that we no longer realise how important it is

arms forthwith in an 'opposition to mood disorder.' We'd all like to rid ourselves of depression, with its sharp hopelessness and jagged bouts of despair, but the idea that we might defeat depression while living on an exhausted planet is more fantastic than anything else that's been

written on the subject.

'Our minds came of age with these daily rich interactions with nature,' says Peter Kahn of our affiliation with the natural world. 'And when we cut ourselves off from that, we suffer.' Pharmacology has pushed this idea off the table. We know that contact with the natural world is good for us: the work of Katcher and Ulrich, as well as our own instincts – when we take the time to listen to them – demonstrate this. We now need to go one step further and ask how the loss of the natural world is affecting us emotionally. Kramer believes that depression has nothing to tell us, that any messages we think we're receiving from it are illusory. But depression has been speaking to many of us for a long time now. Placing it against the landscape of loss that surrounds us – rooting it in the stressed and distressed world that's ours – might help us start to decipher what it has to say.

■ Emily White is a freelance journalist



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CHILD'S PLAY



PHOTOGRAPHS BY SHARON BAILEY



IF YOU GO DOWN TO THE WOODS TODAY

Fear of traffic risks and 'stranger danger' are holding our children captive indoors. For the sake of their health and development, and for the environment they will one day need to protect, we have to find ways of getting them into the wild.

BY TIM GILL

Here's an unusual request from a feature writer: I'd like you to stop reading this article right now. Take a few seconds to remember your favourite place to play as a child.

Where was that special place? What did it look like? How did it smell? Don't carry on reading until you have this place clearly pictured in your mind's eye. Ready to read on? Good. Here are some predictions.

Your favourite childhood place to play was out of doors. It was away from adults. And it was a 'wild' place – not truly wild perhaps, but unkempt, dirty, and quite possibly a little bit dangerous. How can I be so sure? Because over the years I've asked lots of grown-ups this question – parish clerks, senior civil servants, nursery workers, landscape architecture undergraduates, council officials, foresters, politicians, teachers – and they all say the same thing. If you doubt me, just raise the subject at your next coffee break or party and see what comes up.

Now some more memories: what did you do there, in that magical, mysterious spot? Maybe you played tag and hide-and-seek, made mud pies or built dens. You definitely hung out with your best friends, and perhaps you spent time there on your own as well. Your preferences are probably typical not just of your culture, class or generation, but of children across the world and throughout history. It seems that, given the chance, human beings in their middle years of childhood love nothing more than a secret hideaway they can make their own: usually a spot carefully chosen to be just out of earshot of a shouting parent.

Yes, even the UK's current breed of battery-reared, celebrity-fed techno-kids would, given the chance, rather be outside meeting their mates and mucking about than stuck indoors surfing the net. And parents too say that they want their children to be able to

Children are disappearing from the outdoors so fast that they should top any conservationist's list of endangered species

play out more. Yet children are disappearing from the outdoors at a rate that would make them top of any conservationist's list of endangered species if they were any other member of the animal kingdom.

So does it matter that kids aren't playing outside as much these days?

Let's start with health, and specifically with childhood obesity. Here, everyone agrees: playing out keeps kids thinner. Even the Government's own recent public health white paper accepts that

the loss of opportunities for spontaneous outdoor play is one of the main causes of childhood obesity. Dr William Deitz, the leading US Federal Government expert on nutrition and physical activity, claims that play may be the 'magic bullet' experts have been searching for, saying in a *British Medical Journal* editorial, that 'opportunities for spontaneous play may be the only requirement that young children need to increase their physical activity.'

The physical benefits of outdoor play should come as no surprise. What's more remarkable is the growing evidence that children's mental health and emotional well-being is enhanced by contact with the outdoors, and that the restorative effect appears to be strongest in natural settings. Studies at the University of Illinois' Human-Environment Research Laboratory on children with Attention-Hyperactivity Deficit Disorder (ADHD) have shown that green outdoor spaces not only foster creative play and improve interactions with adults, they also relieve the symptoms of the disorder. Although research on the developmental significance of childhood engagement with nature is in its infancy, the researchers are convinced of the depth of the connection between children's well-being and the environment, claiming that contact with nature may be 'as important to children as good nutrition and adequate sleep'.

The great thing about many natural places is that they are ideal environments for children to explore, giving them the chance to expand their horizons and build their confidence while learning about and managing the risks for themselves. These places are unpredictable, ever changing, and prone to the randomness of nature and the vagaries of the weather. But far from being a problem, the uncertainty and variation inherent in natural settings is part of what attracts us to them in the first place. Indeed in evolutionary terms, it is the unsurpassed ability of *Homo sapiens* to adjust to changes in our habitat that has, for better or worse, led us to be the dominant species on the planet.

Which means that a bit of danger and uncertainty is actually good for you. Bringing it back to children's play, the Danish landscape architect Helle Nebelong – creator of some wonderful natural public spaces in Copenhagen – puts it like this:

'I am convinced that standardised play equipment is dangerous. When the distance between all the rungs on the climbing net or the ladder is exactly the same, the child has no need to concentrate on where he puts his feet. This lesson cannot be carried over into all the knobbly and asymmetrical forms with which one is confronted throughout life.'



But there's more to outdoor play than learning and health. Den-building, bug-hunting and pond-dipping make visible the intensity of children's relationship with nature. These primal activities not only show how closely attuned are our senses to the workings of the natural world, but also speak to a deeper spiritual bond with landscapes and living things that leaves impoverished those who, whether by choice or compulsion, lead their lives indoors. In his recent book *Last Child in the Woods: Saving our kids from nature-deficit disorder*, American journalist and parenting expert Richard Louv argues that it is the immediacy, depth and unboundedness of unstructured outdoor play that gives the nature-child encounter most meaning, and that adult-led educational activities are a poor second-best – and in the case of television or the internet, third or fourth best.

Culture of fear

Just why is the decline in children's outdoor experiences happening? The root causes of the dramatic loss of children's freedoms lie in changes to the very fabric of their lives over the last 30 years or so. An exponential growth in road traffic, alongside poor town planning and shifts

in the make-up and daily rhythms of families and communities, have left children with fewer outdoor places to go and fewer friendly faces looking out for them if they needed a bit of help, a cuddle or simply a pee and a glass of water. These changes coincided with – some would say fed into – the growth of what sociologist Frank Furedi calls the 'culture of fear': a generalised anxiety about all manner of threats that found fertile ground in turn-of-the-millennium families, even though children are statistically safer from harm now than at any point in human history. In a textbook demonstration of the mechanisms of the market, these physical, economic and social changes and fears have been exploited by manufacturers and advertisers, whose products and messages both reinforce the logic of keeping children virtual prisoners, and compel us to compensate them in the only way our cash-rich, time-poor society seems to know: by spending money on them.

Successive governments must bear some of the blame for children's captivity, through their promotion of planning policies that relentlessly favour cars over communities and profit over people. But when looking for evidence of political guilt, do not pay too much attention to the

Children love nothing more than a secret hideaway chosen carefully to be just out of earshot of a shouting parent

much-bemoaned fate of playing fields. Ironically, they are now more protected than any other type of land use. In any case, they have always been more important to the sport-playing men who monopolise them than to children, for whom they are way down the list of most-loved outdoor spaces. Studies have shown that, given the chance, children spend more time playing in the bushes, trees and ditches around the edges of playing fields than on the flat green monocultures that are their *raison d'être*. Again, reawaken those childhood memories. For most of us, playing fields were where we took part in the ritual humiliation known as school sport or where, if we ever had the temerity to pay a visit in our free time, belligerent

adults would chase us off, determined not to let our impromptu kick-about ruin their sacred pitch.

No, the real planning crimes lie elsewhere: in racetrack streets, in estates devoid of attractive parks and green spaces, and in town plans that wed families to their cars forever. There's no doubt that traffic danger, unlike stranger danger, is a real threat to children and a legitimate worry for parents. Around 100 child pedestrians are killed every year, a figure that puts the UK near the bottom of Europe's child road safety league. It's no surprise that Government figures show a steady fall in children walking or cycling over the last twenty years or more, to the extent that while over 90 per cent of kids own a bike, just two per cent cycle to school.

The upshot of these policies, which never gave children a second thought, is to trap them in their increasingly well-appointed cells, utterly dependent on the parental taxi service and make them captive consumers of whatever indoor diversions they and their parents can conjure up. Health experts have even coined a new word, *obesogenic*, to describe those aspects of our lives that make us fat, and top of the list is the design of streets, towns and cities.

Time is surely running out for those who want to reengage children with the outdoors. Official Government figures say that over 30 per cent of children aged eight to 10 never play outside without an adult watching over them. And research by Mayer Hillman and colleagues at the Policy Studies Institute suggests that, in a single generation, the 'home habitat' of a typical eight-year-old – the area in which children are able to travel on their own – has shrunk to one-ninth of its former size. Actually, that was between 1971 and 1990, but do you think things have improved for children since then? Neither do I. We face the prospect of a generation of children growing up at best indifferent to, or at worst terrified of, the world outside their homes, and who will then, as adults, pass on their fear of the outdoors to their own children, as Richard Louv starkly evokes in the title of his book.

Natural play

How can this dismal future be avoided? It may be unrealistic to think that we can ever fully restore to children the free-range childhoods enjoyed by my generation. But we can take steps to loosen their cages and extend their territory. My action plan for outdoor play would start with the spaces and places children find themselves in every day: playgrounds, parks, schools and streets. If what best feeds children's bodies, minds and spirits is frequent, free-spirited, playful engagement with



nature, we need to go with the grain of their play instincts and put our efforts into creating neighbourhood spaces where they can get down and dirty in natural outdoor settings, free of charge and on a daily basis.

That's exactly what the authorities are doing in Freiburg, a German city with strong green credentials situated on the edge of the Black Forest. For over a decade now Freiburg's parks department has stopped installing the sterile playgrounds full of tubular steel, primary coloured plastic and expensive rubber surfacing, and instead has been creating 'nature playgrounds' that are a bit more, well, earthy. The resulting landscapes are diverse spaces with mounds, ditches, logs, fallen trees, boulders, bushes, wild flowers and dirt. Full of secret corners and shady spots, they are just like the wild spaces of our childhood memories. Yet they meet the same Europe-wide safety standards as UK playgrounds.

As Freiburg's existing public play areas wear out, the parks department works with local children and adults to create these new-style nature playgrounds. Over 40 have been built so far, and they are designed with a lifetime in mind. Trees, bushes and flowering plants are carefully chosen to create playful nooks and crannies, to attract insects and birds, and to mature and spread, adding mystery and richness to the site as the years go by.

The construction methods of Freiburg's nature play areas are a model of sustainability compared to the raw materials, heavy industrial processes and carbon emissions that go into building conventional playgrounds. And if the aesthetic and environmental arguments are not enough to win you over, perhaps the price tag will. Freiburg's nature play spaces are typically half the capital cost of a conventional fixed equipment play area of the same size, simply due to the high costs of tubular steel, coloured plastic and unnecessary hi-tech rubber surfacing.

The approach was introduced after research by the city's university showed that simply having good green space near children's homes encouraged them out of doors and away from the TV. The playgrounds have attracted international interest. Not surprisingly, children love them too.

The UK is light-years behind Freiburg and Copenhagen – and for that matter much of Northern Europe. But even here, what might be called a 'movement for real play' is beginning to spread.

In Newcastle, local residents involved in improving Exhibition Park organised a 'den day' to introduce children to the joys of shelter building. Asked what they thought about the day, one boy

said: 'I love this, getting really filthy dirty!' while a girl responded: 'If I could rewind back to this day every day I would. This is a mint day!' In Scotland, Stirling Council has been inspired by Helle Nebelong to create natural play spaces across the authority. While one site was still being built, children started wrestling in the mud created by the construction works, and their mums persuaded the council to keep the muddy areas for good. In the South West of England 'Wild About Play', an environmental play project, is supporting hundreds of playworkers and environmental educators by sharing playful ideas for outdoor activities. Children have told the project that what they most want to do in the great outdoors is to make fires and cook on them, and to collect and eat wild foods. Another environmental project, Greenstart, aims to show the benefits of contact with green spaces for younger children through running activity programmes in local outdoor spaces in Northumberland. One five-year-old boy involved in a family tree planting event said: 'I can't wait to go back and see my tree.' In Cambridge, Bath and Haringey, that near-extinct species the park keeper is appearing in a new guise. Called 'play rangers' they are specially trained and run playful activities at set times, helping to build up usage, familiarity and ultimately ownership of these spaces. Forest schools – where teachers regularly spend whole days in the woods with their classes – are starting up in many woodland areas, supported nationally by an alliance of conservation charities, the Timber Trade Federation and the Forestry Commission. The charity Learning through Landscapes is helping schools across the country create some fine natural playgrounds.

Not content with just forest schools and traditional playgrounds, the Forestry Commission in England has been working with me to look at other ways we can attract and engage children and young people in woodlands. We recently visited Freiburg's nature playgrounds and were inspired by what we saw. Realising that adventure is an essential feature of any woodland visit, we have started thinking about ways to give children – and their parents – the confidence to enjoy more intimate, unregulated contact with the wildlife and landscapes of the woods. At some sites, we are looking at literally pulling down the fences between the play areas and the forest beyond. At others, we want to give children the message that they are not just allowed to build dens and dam streams, they are positively encouraged to do so. If you think this sounds reckless, remember: children are better at managing the risks in natural settings than we give them credit for. After all on a beach, the sea is anything but safe, but have you ever seen

30 per cent
of children
aged eight
to 10 never
play outside
without
an adult
watching
over them

WE NEED A CAMPAIGN

To stand a chance of restoring the outdoors as childhood's rightful domain, a movement for real play needs to do more than just create projects on the ground, however inspiring these may be. We need a high-profile campaign with clear objectives, powerful advocates and at its heart a vision of children once again claiming their rightful place out of doors and immersing themselves in nature.

We need:

- a national programme to upgrade the thousands of parks and public play areas that many councils will otherwise leave to rust and rot.
- housing developers to be required by law to create attractive, playful green spaces within easy reach of every child and family, and to ensure that streets are designed as home zones.
- politicians to get the message that a speed limit of '20' really is 'plenty' in streets where children live.
- to tell Government that it's not acceptable to build schools with postage stamp-sized playgrounds devoid of greenery, or to warehouse children in nurseries with no outdoor space.
- to involve children themselves in creating and maintaining play spaces, so that their views can be taken into account and they feel ownership of the results.

All this may sound ambitious, but public campaigns can still make a difference. No one in Government gave school meals a second thought until Jamie Oliver switched on his food processor and showed us the truth about the 'food' we were offering the nation's children. Imagine the waves that J K Rowling, say, would make if she declared that, when it comes to stretching a child's spirit, the nation's playgrounds offer a diet of adventure unworthy of any aspiring Harry Potter. Picture the impact that David Attenborough would have if he argued that children out of doors are just as good an indicator of the quality of their habitats as wild salmon are of theirs, and deserved just as much protection.

a fence between you and the shoreline?

Exciting outdoor environments are all very well, but children have to be able to get to them. Of course, streets are the starting point for so many children's independent outdoor adventures, and with traffic rising every year, the prospects for reclaiming them may look bleak. But green shoots of hope are springing up amidst the gloom. Contrary to what car-loving journalists might say, many communities are crying out for safer streets with lower speed limits and less traffic. A growing alliance of environmental, road safety and children's agencies has signed up to '20's plenty', the call for a standard speed limit of 20 mph in residential areas. Some communities have gone even further and worked with local councils to create 'home zones': people-friendly streets based on continental designs, where the streetspace is transformed from a car corridor to a shared social space in which people can meet, children can play and the car driver is a guest. Having been

part of the original campaign to introduce home zones to the UK a decade ago, I recently surveyed some 40 schemes to find out their impact. Over half reported more children walking, cycling and playing in the street. Intriguingly, some schemes have also seen falling crime rates and rising levels of community activity in the form of litter collections, festivals and street parties.

Parental guidance

We parents also have the power to resist the seductions of consumerism and play our part in restoring to children some of the freedoms we took for granted when we were young. We can say no a little more, switch off the screens and direct our children's curious eyes to some altogether more expansive vistas. In doing so, we need to face up to our fears and chip away at the free-floating anxiety that can so easily beset us. Some threats – traffic, for instance – are real, and can ultimately only be tackled by governments in response to political pressure. But others need to be seen for what they are: a social neurosis stemming from a collective loss of nerve.

For instance, in the UK we have become completely paranoid about the threat to children from strangers. Fewer than one child in a million is killed by a stranger each year. The numbers have if anything declined since the Second World War. Over ten times as many children are killed by cars, and around five times as many by their own parents or relatives. Yet on the mercifully rare occasions when the worst does happen, the headline that greets us is 'no child is safe'. As a parent, I believe it's about time we rose up *en masse* and showed this fear for what it is: scare mongering. The media has to shoulder much of the blame. Their hyper-emotive stories appear cruelly crafted to scare us witless, undermining any attempt by readers and viewers to balance a reasonable interest in human tragedy with a realistic assessment of the risks.

The real tragedy is that parents' anxieties and restrictions feed the very fear of the outdoors that gets so readily translated into 'stranger danger'. Criminologists have long known that in streets, parks and playgrounds there is safety in numbers. Turn that around and you get deserted streets, underused parks and empty playgrounds leading to a vicious circle of fear, vandalism, misuse and decay. So I say to every parent, wake up and smell the fresh air: take your child to your local park and help save the planet. Better still, why not arrange some outdoor play dates with fellow parents? You'll help spread that outdoor vibe, your child will have twice the fun and who knows, you might even enjoy yourself.

You may think that risk aversion, together with its legal offspring the compensation culture, are everywhere. Barely a week goes by without the media reporting some or other nonsensical health and safety diktat allegedly handed down from on high. Conkers, pet corners, egg boxes, even daisy chains have been deemed a danger too far for our children.

My response once again is: use your common sense and don't believe the hype. The safety Nazis and the compensation culture are, if not quite myths, then certainly paper tigers. Here's a quote: 'An essential part of the process of a child becoming an adult is the need, and desire, to explore limits and to try new experiences.' Read that quote again and think about it. Its source may surprise you. It is not from the youth wing of the Dangerous Sports Club. It is from CEN, Europe's leading safety standards agency. As a statement about what children deserve, you could not wish for anything clearer. What would most help parents cure themselves of risk anxiety is more of these reassuring, supportive messages: more voices that say: 'You can be a good parent and still give your children a taste of freedom.'

Turning to the courts, the reality is that they are no more likely today to hand down daft judgements than they were 10, 20 or a hundred years ago. To take just one example, a recent ruling actually forced the Corporation of London to allow swimmers access to Highgate Ponds even when lifeguards are not present. Janet Paraskeva, chief executive of the Law Society, says: 'In recent years accident claims, far from rising, have remained static and then fell last year by 9.5 per cent.' Again, it is down to each of us to challenge the myth of the compensation culture and to restore some balance.

Too many children spend far too much time stuck in front of screens, not so much couch potatoes as couch prisoners. Too many of the streets where children live have become the sole domain of the car. For too long children's outdoor play has been overly haunted by the spectre of the predatory paedophile and the health and safety zealot. Too many parents forget their own childhoods and switch off their common sense, excessively influenced by sensationalist media coverage on the one hand and seductive advertising on the other.

It is also likely that 'battery-reared' children will lack confidence as they grow up and be more vulnerable to bullying. Researchers have found a link between children who become victims of bullying and the protectiveness of their parents. And in 1999 the report *Bright Futures: Promoting Children and Young People's Mental Health* from the

Mental Health Foundation warned of the dangers of overprotecting children and stopping them from developing their own coping mechanisms.

All this is a disaster for anyone who wants to bring freedom, adventure and nature back into the daily rhythms of children's lives. Surely it's about time we all recognised the value of allowing children to truly get to grips with the knobbly and asymmetrical forms of the natural world. Just as we all did when we were young.

■ Copyright Tim Gill, Writer and consultant
www.rethinkingchildhood.com

OUTDOOR PLAY CONTACT LIST

Fair Play for Children: www.arunet.co.uk/fairplay
Federation of city farms and community gardens: www.farmgarden.org.uk
Forest Education Initiative: www.foresteducation.org/forest_schools.php
Free Play Network: www.freeplaynetwork.org.uk
Green space: www.green-space.org.uk
Haringey play rangers: www.haringey-play.org.uk
Helle Nebelong: www.sansehaver.dk
Learning through Landscapes: www.ltl.org.uk
Natural Learning Initiative: www.naturalearning.org/index.html
Playlink: www.playlink.org.uk
Transport 2000 speed campaigning: www.transport2000.org.uk
Wild About Play: playwork.co.uk/wildaboutplay
Woodland Trust: www.wildaboutwoods.org.uk

EMAIL FOR MORE INFORMATION...

Exhibition & Brandling Parks Community Trust: keith.pimm@virgin.net
Greenstart: angus.robson@groundwork.org.uk



BOOKS

Teaching the trees – lessons from the forest

Joan Maloof
University of Georgia Press
\$24.95

Joan Maloof is a biochemist who finds work in the laboratory boring. She's also an unrepentant tree hugger. This restlessness and love of nature takes her on a personal journey around the forests of the US, recorded here in a series of essays, each one revolving around a different species of tree. What sets this book apart, aside from the quality of the writing, is that as well as her activist emotional plea for us to save our remaining trees, her scientific understanding enables her to make a cogent case for the importance of biodiversity. Most of all though, this is a book for anyone who loves trees and wishes to deepen their understanding of them.

Reviewed by Claire Boyce

The Troublemaker's Tea party – a manual for effective citizen action

Charles Dobson
New Society Publishers 2005
\$15.95

Perhaps it's a sign of how far we've sunk, or maybe a sign that we've turned a corner, but in this era of endless 'how

to' books, I suppose eventually there was bound to be one that might as well have been subtitled 'How to build yourself a vibrant community'. Cheap jibes aside, this really is a practical little book. It is directed at an American audience but is applicable to us all – with chapters laying out advice on a host of topics for people who realise that if they want a better life there is no point waiting for the government, council or local supermarket to do it for them. How to organise your community around an issue, how to protest to your elected officials, how to get the newspapers to listen – sensible advice is given for these and many other community-based actions. But note, this is no *Anarchist's Cookbook*. It's aimed at everyday people who are tired of waiting for someone else to improve their lives. In other words, us all.

Reviewed by Sarah McCarthy

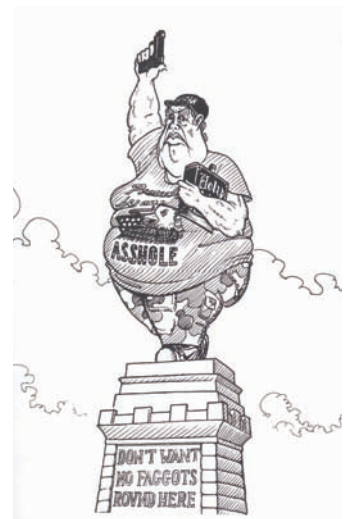
Crimes against nature – standing up to Bush and the Kyoto killers who are cashing in on our world

Robert F Kennedy Jr
Penguin
£7.99

What makes this book important is not just its subject matter. The litany of crimes against humanity and our planet that have been caused by the Bush administration is far from news. What matters is its author. If there are two families that define US politics of the last 40 years, it's the Bushes and the Kennedys. So that one of the latter, himself one of the US leading environmental lawyers, should publish such

an excoriating attack on the incumbent president should make people sit up and notice. At the very least, the famous surname should get the book and its author wide publicity, and, one hopes, bring the truth about George Bush Jnr and his corporate cronies to a wider audience. It's not enough for the US public to have given up on what their president is doing in Iraq. They have to feel the same about what he is doing at home and to the rest of the planet.

Reviewed by Rufus Weston



Why do they kill me?

Cartoons by Tim Kreider
Fantagraphics books 2005
\$14.95

Less a collection of cartoons, more a searingly angry document of our times, this collection Kreider's cartoons span the last four years of Bush's home and foreign policy. Drawn with the same grotesque savagery as Ralph Steadman, they pull no punches. As Mark Crispin Miller writes in the introduction: 'Given the near stupefying grimness of this moment, the alarmist view



that ought to be most precious to us is the one that offers no false consolation, and yet makes us laugh till it hurts.' Krieder's cartoons do just that, but really no text can do justice to cartoons like these, the best thing to do is look at them for yourself (see left).

Reviewed by Rufus Weston

Vital signs 2005 – the trends that are shaping our future

The World Watch institute 2005
WW Norton & Co.

\$16.95

As oil prices soar amidst rising prophecies of climate doom, and natural disasters like Hurricane Katrina seem to hit our world with increasing intensity and regularity, it can be difficult to sift the facts from the hearsay and opinion. But if you want to know which way the world is really heading, there are few better places to start than with the annual report from the Worldwatch Institute. Vital Signs 2005 compiles facts and figures from the most

Images from Silence at Ramscliffe by Chris Chapman and James Crowden



authoritative and unbiased of organisations on a breadth of key indicators. Forget what the politicians tell you, here is the news. World production of cars jumped 4.5 per cent in 2004 to 44 million. The number of hungry people increased for the first time since the 1970s, to 852 million daily. Every hour the world spends more than \$100 million on soldiers, weapons and ammunition. And at least 160,000 people are dying every year as a result of climate change.

Reviewed by Scott Bayliss

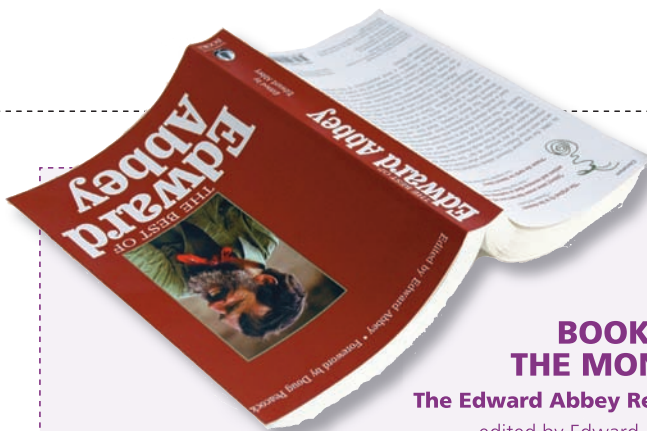
Silence in Ramscliffe – Foot and mouth in Devon

Chris Chapman and James Crowden

Bardwell Press 2005

£25 (hardback)

Everyone has seen the news footage, the airborne cameras sweeping over distant smoking pyres. But like in Iraq, seen from long range the story becomes less human, less personal. Chapman and Crowden's beautiful (it is the right word) book redresses the balance. As you go from black and white image to black and white image



BOOK OF THE MONTH

The Edward Abbey Reader

edited by Edward Abbey

Sierra Club books 2005

\$16.95

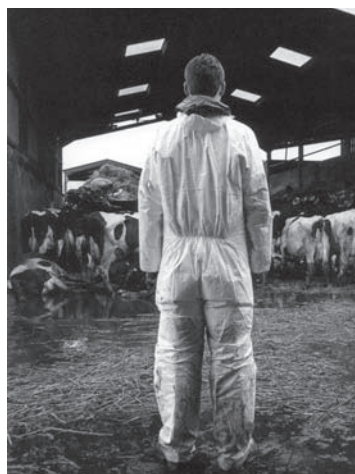
Like most people, my first encounter with Edward Abbey was when I read *The Monkey Wrench Gang*, his classic novel of environmental rebellion in the Utah desert. It had an effect on me like no other, a reminder that fiction can often have more power to move us than fact. However, apart from his most well-known work, most of Abbey's writings – a mixture of novels and nature essays, many of which are set in his beloved desert scenery – are very hard to come by. For this reason alone this reader, in which the author himself made the selections before he died, is a welcome addition to any bookshelf. It is made even better because it doesn't make the criminal mistake of giving too much away – yes there is an excerpt from *The Monkey Wrench Gang* here, enough to whet the appetite, but not enough to spoil the treat to come. A magnificent introduction to one of the environment's true heroes, a man who reminded us that saving the earth was supposed to be fun.

Reviewed by Sam Clements

and watch the story unfold, you see a traditional lifestyle – one of cows being herded down narrow lanes and lambs taking

their first faltering steps – wiped out at a shot with a bolt from the MAFF official's stun gun. Sheds lie empty, cattle lie dead and farmers who have worked these hills for most of their lives are left staring at the loss of all they know and understand. A harrowing, yet necessary book.

Reviewed by Jeremy Smith



CD OF THE MONTH

Matthew Herbert - Plat du Jour

Accidental recordings 2005.

Matthew Herbert doesn't make music about things, he makes music out of them. So, for his latest album, an attack on our relationship with food, he uses



everything from the sound of an industrial chicken farm, to 365 people crunching into apples, to a tank running over a meal cooked by Nigella Lawson for Bush and Blair on the eve of the Iraq War. It's a series of strange, challenging concepts that work as so much more than just concept.

The music is often eerily beautiful. It is far from obvious where the sounds come from (the extensive liner notes help) but when you realise you are listening not to strings or percussion, but to the sound of food frying or endangered seeds being shaken, it forces you to confront your preconceptions – first of what we expect from music, but more importantly of our relationship with our food. Unlike so many 'activist-artists' however, Herbert doesn't make the mistake of over-sermonising. His music, however unusual its source, is made to be listened to as music. Because he's a successful musician (he is playing a gig at London's Barbican this month), he gets interviewed a lot, and his novel *modus operandi* forces interviewers to confront him on his techniques and, as a result, his subject matter. It enables him to talk about issues not normally found in music magazines and on chat shows. In so doing he performs a service that few other artists are brave enough to do – using our obsession with celebrity expressly as a medium to bring up important issues, not as some self-agrandising act of Bono-fication, but because if that's the only way the world will listen, use it.

Reviewed by Jeremy Smith

EVENTS

16 OCTOBER

INTERNATIONAL DAY OF ACTION AGAINST MCDONALD'S, to mark World Food Day. Visit www.mcspotlight.org for more information. Adopt your local store – for ready-made leaflets telephone 0845 458 9595 or email mclibel@veggies.org.uk Visit www.mcspotlight.org for more information.

22-24 OCTOBER

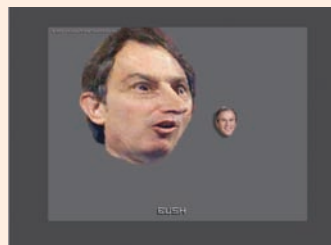
PUT THE BRAKES ON ROLLS ROYCE RAYNESWAY. Trident Ploughshares are organising a weekend of action against Rolls Royce in Derby: the driving force behind Trident. Rolls Royce Raynesway is the plant in Derby responsible for producing reactor fuel for Trident submarines – essential for Britain's nuclear weapons of mass destruction. 0845 458 8366 <http://tridentploughshares.org>

WEBSITES OF THE MONTH

MINIATURE EARTH

http://www.luccaco.com/miniatureearth/miniature_earth.htm

If we could run the population of the earth into a small community of 100 persons it would look something like this: six people own 59 per cent of the entire wealth of the community, 13 are hungry, just one less than the number who can't read and six more than those educated at secondary level. If you keep your food in a refrigerator, and your clothes in a wardrobe you are richer than 75 per cent of the world.



BUSH AND BLAIR

<http://www.andyfoulds.co.uk/amusement/bushv2.htm>

It's mindless, it won't change the world, but it's probably as much fun as you are going to have with Bush and

Blair in your lifetime. Tweak their noses, shake their heads and generally treat them like the two dimensional figureheads they are.



JUST CURIOUS

<http://justcurio.us>

Generally we at *The Ecologist* don't see computers as a wonderful way of connecting people, rather as a way of keeping them behind their screens

locked in lonely communion with nothing but the net. But this whimsical little site could be seen as a way of humanising a world where Google makes us think all the answers are on the web, rather than in each other's minds. Got a question you want answered? Just type it in. The only catch is that you've got to answer someone else's first. We're not just talking facts here – advice, theories, anything that's on your mind. As the site puts it: 'This is our chance to lean on each other, to look to a stranger for help, to discover what other people think.'

Who knows, we might even start doing it in the real world again too.

THE END OF THE INTERNET

<http://www.shibumi.org/eoti.htm>

Simple and brilliant. You'll only go the once. But a necessary corrective to all the rest of the time you spend searching the net for needless stuff.

Your 26-page guide to ethical living

green pages

OCTOBER FOOD FOR FREE

Celebrate the Celtic festival of Samhain with...

Pickled walnuts;
Sea Beet salad;
and Blackberry
jams, jellies and
fools

'Whether you are a vine or a human being – you are what you eat'. Meet Josep Maria Albet i Noya, one of Spain's finest organic wine producers

ESSENTIAL DIRECTORY

If you really want to make a difference, don't shop in supermarkets or chain stores, shop here...

PUMPKIN

Time to turn your toothy orange pumpkin head into a feast... whole pumpkin baked with cream; pumpkin risotto with crispy sage; or possibly a simple pumpkin tart?





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wondered
what's in
your
water?**

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Wine,
page 82



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76 October in season

Don't despair of summer's end – celebrate the celtic festival of Samhain, when the border between the spirit and human world blurs – with pickled walnuts and cheddar cheese; blackberry jams, jellies and fools; a sea beet and tomato sandwich; or simply lie back amongst common mouse-ears and leafy hawkweed and remember spirits passed.

78 October recipes

Time to turn your toothy orange pumpkin head into a feast. Take your pick from these River Cottage kitchen marvels: whole pumpkin baked with cream; roast squash soup; pumpkin risotto with crispy sage; pumpkin tart... all washed down with a tall glass of Gideon's apple bramble.

82 Vineyard profile – Albert i Noya

Josep Maria Albert i Noya, who's family have been on the land for 700 years, avoids all the chemical trickery associated with modern wine production. After all, as he explains in his thick Catalan accent, 'whether you are a vine or a human being – you are what you eat'.

84 Reader Offers

15% off super soft organic cotton towels.
Win a recycled vintage belt wallet.
40% off organic skincare products.

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 or chain stores... shop here.

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Seasonal recipes
from
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OCTOBER IN SEASON

Bettina Trueb seeks out the origins of Halloween

HALLOWEEN – 31 OCTOBER

The roots of Halloween can be traced back to the Celts, who celebrated the end of the year with a festival called Samhain (pronounced Sowain) on November 1. They believed that this was a time when divine spirits and ghosts could wander freely, because the border between their world and that of men became blurred. The ghosts and divine spirits were believed to interfere (sometimes violently) in the affairs of the living.

In order to placate the gods and calm the evil spirits, as well as ensuring that the sun would return after the winter, the druids carried out sacrifices in the open air. These were mostly offerings of animals, but sometimes also of humans, who were piled up with timber and burned. The word 'bonfire' comes from 'bone fire', referring to the skeletons of the sacrificed animals.

On Samhain, all domestic fires except those of the druids

were extinguished and people were levied a fee to relight them from the sacred bonfires. Furthermore, fires were lit to burn all through the winter.

The end of October was also the time when food stocks were prepared for the winter and livestock moved into winter quarters. There was also an element of praise involved in the celebrations, as well as invoking the gods for prosperity for the coming year.

The practice of trick-or-treating is sometimes also traced back to Samhain. It is believed that people were trying to appease wandering spirits with gifts of fruit and nuts. In order to hide from the evil spirits, people tried to blend in with them by masquerading. Others connect it with a custom called 'souling', whereby beggars would come to peoples' doorsteps asking for 'soul cakes', promising one prayer per cake for the dead relatives.

October

FRUIT & VEGETABLES



VEGETABLES:

- Asian Greens
- Beans – French, runner
- Beetroot
- Broccoli – headed
- Cabbage
- Carrots
- Cauliflower
- Celeriac
- Celery
- Cucumbers
- Currants
- Fennel
- Garlic
- Jerusalem Artichoke
- Kale
- Kohlrabi
- Leeks
- Lettuce – indoor and outdoor
- Mushrooms
- Onions
- Parsnips
- Peppers
- Potatoes
- Pumpkins
- Radishes

- Shallots
- Spinach
- Spring Onions
- Summer Squash
- Swede
- Sweetcorn
- Swiss Chard
- Tomatoes
- Turnips
- Watercress
- Winter Squash

FRUIT:

- Apples
- Pears



OCTOBER FOOD FOR FREE

Blackberry – Known as brambles in Scotland, blackberries have been eaten since the Neolithic age. There are thought to be more than 400 microspecies in Britain. They can be used in pies, fruit fools, salads, jellies, jams, and for juice.

Sea Beet – Also known as sea spinach, it is common around the coastline, on cliffs, shingle banks, dunes, and sea walls. It has shiny, fleshy leaves that may grow as large and heavy as those of cultivated spinach. The smaller leaves are tender and ideal for salads, while larger ones should be boiled.

Walnut – Originally from Southern Europe, the walnut has been cultivated in Britain for about 500 years. They're best from late October onwards, when the fruits are fairly dry.

Jack-by-the-hedge – An annual or biennial frequently found waysides, on hedge banks and in open woods, this plant is up to 28 inches tall. It has fresh green and slightly toothed leaves and smells slightly of garlic. Finely chopped, it can be used in salads and goes particularly well in a sauce to accompany lamb.

Sweet Chestnut – This well-distributed tree is up to 30m tall with single, spear-shaped and serrated leaves. Its fruit is contained in green spherical cases with long spines, usually two or three in one case. They can be roasted, used for puree, or ground into flour.

SOME PICKING RULES

- Never strip a plant completely.
- Never take the flowers and seeds of annual plants: they rely on them for survival.
- Never pull up whole plants.
- It is unwise to gather any sorts of produce from areas that may have been sprayed with insecticide or weed killer.
- Avoid, too, the verges of heavily used roads, where the plant may have been contaminated by exhaust fumes.

Source: Food For Free by Richard Mabey (Collins)

WILDFLOWERS TO LOOK OUT FOR IN OCTOBER:

Common Centaury: An annual of sand dunes, cliffs, woodland margins and grassland around the coast with pink tubular flowers and pale green leaves in a rosette.

Water Mint: Hairy flowering stems up to 60cm tall with tiny, mauve-coloured flowers gathered in domed heads around the stem. This is a perennial herb of marshes, fens, wet woodlands and fresh water margins.

Leafy Hawkweed: Its branched stems are up to 80cm tall with yellow flowers consisting of rays of florets and scale-like bracts curved back at the tip. The fruits are heads of nutlets with a top of white hairs. It grows on dry grasslands, heaths, roadsides and open woodlands throughout the UK.

Common Mouse-ear: This perennial of meadows, wasteland, roadsides, grassland and sand dunes has slender hairy stems, narrow oval leaves and small white flowers with deeply notched petals gathered in loose, branched clusters.

Greater Plantain: Leafless flowering stalks with tiny greenish flowers gathered in long dense spikes. Its leaves are broad and veined, forming a rosette at the bottom of the stem. It grows on wasteland, trampled ground as well as on cultivated and arable land and in gardens.

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



Water mint

SEASONAL RECIPES FOR OCTOBER

Pumpkins are great for much more than sticking candles in, as **Hugh Fearnley-Whittingstall** and **Gill Meller** show with these seasonal recipes.

When the leaves are still turning from green to yellow (which is usually the case at the beginning of October), then as long as the weather is fine you can continue to persuade yourself it's summer. But when the leaves are unambiguously brown, and there are almost as many of them on the ground as there are on the trees (which is always the case by the end of October), then it's time to face facts: summer's over. That's okay, though, because now you can concentrate on the many culinary delights of autumn.

You certainly don't need to live in the country to forage for fungi. Urban enthusiasts should be on the alert too. Many of our parks and play areas have grass and wooded areas that are unsprayed and ungrazed, and therefore prime habitat for wild-mushroom hunting.

And, of course, it would be criminal not to make the most of our native apples and pears. I have chosen six varieties of apple for my little orchard, with two trees of each variety. My aim was to get a range of delicious, characterful apples, favouring those that are crisp and tart over ones that may be sweeter and softer

Apples should be kept in a cool larder, or even the fridge, and they will remain the outstanding seasonal treat that they ought to be!



VEG OF THE MONTH – PUMPKIN/SQUASH

WHOLE PUMPKIN BAKED WITH CREAM

This is an incredibly simple, elegant dish, in which the finished 'soup' is scooped out from the whole baked pumpkin. It is rich, filling and satisfying, so makes ideal sustenance after some hard graft in the garden on a cold autumn day. You can use as big a pumpkin as will fit in your oven, but be aware that if you use a real monster, judging the cooking time becomes hard and the risk of collapse increases greatly. You will use a huge amount of cream and cheese, too, so you need to have a lot of hungry people on hand. You can also make this recipe with small squash varieties, such as acorn or Sweet Mama, and serve one per person.

Ingredients: A medium pumpkin serves 4-6 generously
1 medium (3-4kg) pumpkin or several small squashes (1 per person)
Up to 500g Gruyère cheese, grated (depending on the size of your pumpkin)
Up to 1 litre double cream (ditto)
Freshly grated nutmeg
A knob of butter
Salt and freshly ground black pepper

Slice off the top quarter of the pumpkin or squashes and keep to one side, this makes your lid. Scoop out all the seeds and surrounding fibres from the pumpkin. Place the scooped-out pumpkin on a baking tray or in an ovenproof dish (which must have sides to catch any leaking cream – an accident that shouldn't, but can

happen). Put enough grated Gruyère into the empty cavity of the pumpkin to fill about a third of it, then pour in double cream until the cavity is two-thirds full. Add a few gratings of nutmeg, a little salt and plenty of black pepper. Throw in a knob of butter and replace the lid, so that the pumpkin is whole again.

Place in a fairly hot oven (190°C/gas mark 5) and cook for 45 minutes to 1 1/4 hours, depending on the size of the pumpkin. Test for doneness by removing the lid and poking at the flesh from the inside. It should be nice and tender. At this point, the skin may be lightly burnt and the whole thing just beginning to sag a bit. Be careful: when the pumpkin is completely soft and cooked through, there is a real danger of collapse. The larger the pumpkin, the bigger the danger. Don't panic if it happens – it will look a bit deflated but will still taste delicious.

Serve small squashes in individual bowls, with spoons to scoop out the flesh. Serve the larger pumpkin by scooping plenty of flesh and the creamy, cheesy liquid (the Gruyère comes out in lovely long, messy strings) into warmed soup bowls. Either way, serve piping hot.

ROAST SQUASH SOUP

Ingredients: 2 small squashes
2 tablespoons of olive oil
6 garlic cloves
Salt
Black pepper
1 litre of chicken/vegetable stock
Olive oil

Take the two small squashes (there's no need to peel them) and cut them into rough chunks. Scrape away the pips and surrounding soft fibres, lay the pieces in a large roasting tin and trickle two tablespoons of olive oil over them. Scatter six garlic cloves, whole with skins on, but lightly crushed, into the roasting tin and season well with salt and black pepper.

Put in the oven (190 degrees/gas mark 5) for 35-40 minutes, turning them if you like until the pieces are tender and browned. Use a spoon to scrape the soft flesh from the skin, liquidise it and set on one side. Heat one litre of chicken/vegetable stock in a large pan. Squeeze out the flesh of the roasted garlic cloves and put in a liquidiser with enough stock to cover (do this in batches). Liquidise until completely smooth then pour into the pan of stock. Add the squash, taste, then adjust the seasoning and stock to get the right consistency. It should be nice and creamy. Heat the soup through without letting it boil. Meanwhile fry a few slithers of garlic in oil and scatter these crispy shards over each serving. Finish with a trickle of olive oil or Moroccan argan oil.

PUMPKIN RISOTTO WITH CRISPY SAGE

Ingredients: 600ml vegetable/chicken stock
1 small onion chopped
2 tablespoons olive oil
12 sage leaves chopped fairly finely
170g Arborio rice
250g (peeled weight) pumpkin/squash, diced small. Butternut is good.
50g butter
Salt and freshly ground black pepper

To Finish:

2 tablespoons sunflower oil
12-16 sage leaves
A fresh piece of parmesan/pecorino cheese

Heat the stock until it's almost boiling, then keep over a low heat. In a heavy-based pan, sweat the onion in the oil until soft but not browned. Add the chopped sage and



cook for a couple of minutes. Add the rice and stir for a few seconds to cover the grains with oil, then pour in about a third of the stock and bring to a gentle simmer. Cook until almost all the stock has been absorbed, stirring regularly, but not all the time. Add the squash with more stock and continue to simmer gently, stirring occasionally, until the stock has been absorbed. From then on add more stock a little at a time, until the squash is soft and the rice is al dente. You may not need all the stock but the risotto should be loose and creamy. When it's almost ready, heat the sunflower oil in a small pan and quickly fry the sage leaves until crisp – this takes a matter of seconds. Stir the butter into the risotto and season well with salt and pepper. Divide between four bowls and throw a few crispy sage leaves over each portion. Bring the cheese and a grater to the table for your guests to help themselves.

GIDEON'S APPLE BRAMBLE

Equal quantities of:

Gin
Lemon juice
Crème de Mures (Blackberry liqueur)
Apple juice (freshly juiced)
Crushed ice
Thinly sliced apple pieces
Fresh blackberries
A tall glass

Layer the crushed ice, apple slices and blackberries in the glass. Once the glass is full, mix the remaining ingredients, and pour slowly over the crushed ice.

(This recipe by Gideon Hitchin)

SALAD OF ROAST SQUASH, SCALLOPS, SAGE AND GARLIC

Serves 4

Peel two large squash, such as Butternut or Crown Prince. Cut into 1 inch chunks, and place in a roasting tin along with 12 bruised sage leaves, four cloves of garlic, peeled and thickly sliced, 150ml of olive oil or pork fat and a generous seasoning of salt and pepper. Roast the squash in a pre-heated oven, set at 200°C (gas mark 6), for 45 minutes or until soft and coloured round the edges. Take 16 really fresh king scallops, and season lightly with salt and pepper, and brush with a little olive oil. Put a large griddle pan over a high heat and when hot sear the scallops for no more than two minutes each side. In a large mixing bowl, gently combine the scallops and the squash together. Finish with some chopped flat leaf parsley and a squeeze of lemon juice. Arrange the salad over four warmed plates, and allow four scallops per person.

PUMPKIN TART

Serves 8 – 10

I found that roasting the pumpkin for the filling works well and imparts an interesting flavour to this unusual but delicious dessert.

Peel and slice the pumpkin into wedges; discard any seeds and fibrous strings. Lay the pumpkin pieces out in a tray with two broken cinnamon sticks, a knob of butter and a tablespoon of soft brown sugar. Roast in a medium to hot oven until soft. Scoop the cooked pumpkin flesh into the bowl of a food processor, to this add a good pinch of finely grated ginger, and 100g of golden caster sugar, pulse until smooth. Set the puree aside to cool in a clean mixing bowl.

To make the sweet pastry

Place 250g of plain flour, 150g of butter and 50g of golden caster sugar in a food processor and pulse until it reaches a breadcrumb consistency. Then add two egg yolks, followed by



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about 100ml of milk, which should be added in a gradual stream. Watch carefully as you pulse the mixture and stop adding the milk as soon as the dough comes together.

Knead a couple of times before wrapping in cling-film and chilling in the fridge for at least half an hour. Roll the pastry out to 3mm and line an eight inch tart case. If you leave the edges over-hanging (you can cut these off later) and prick the base with a fork, you won't need baking beans. Bake at 150°C for about 15 mins or until the base is dry but not coloured.

Lightly beat two large organic eggs with 300ml of double cream, to this add the puree. Combine well. Pour the filling into the blind baked tart case and bake until soft set. This will take about 40 mins.

Allow the tart to cool before eating. Serve with cinnamon ice-cream.

And one for the carnivores...

PHEASANT AND SQUASH PIE

This is a simple rustic pie perfect for an autumn supper.

Serves 2-4

- 1 plucked, drawn pheasant. Jointed.
- 100g piece of bacon or salt pork belly
- 1 pig's trotter split lengthways
- 1 bulb of garlic
- 1 medium sized squash, peeled cored and diced
- Glass of white wine
- 500ml of chicken or pork stock or water
- Little bunch of thyme
- 2 bay leaves
- Salt and pepper
- 750g puff pastry

Heat a large casserole. Add the pork belly cut into chunks. Let it render a little fat, then remove with a slotted spoon and set aside. Season the pheasant pieces and then add to the same hot pan, brown well. Split the garlic bulb in half and add to the pan along with the split pig's trotter, thyme, stock, bay leaves and a pinch of pepper.

Bring to the gentlest of simmers, put a lid on and cook very gently for one hour.

At this point add the chunks of squash to the casserole. Cook for another 15 mins.

Pour the cooking liquid through a sieve into a separate pan and reduce by half.

While this is happening pick the meat from the pheasant.

Try and keep it in fairly generous chunks. You can at this stage pull the flesh and skin from the trotter, it's optional but advisable. Squeeze the garlic pulp from its skin. Combine the meats, squash and garlic with a teaspoon of chopped fresh thyme and set aside in a bowl.

Divide the pastry in two and roll out both pieces. These will be your pie lid and pie base. Line an 8 inch pie dish with one of the pastry sheets and trim to size.

Spoon in the filling and pour over the reduced cooking liquor. Place the second pastry sheet on top, trim to size, crimp the edges and glaze with an egg wash.

Bake in a preheated oven at 190-200C for 40 mins until puffed up and golden.

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ALBET I NOYA

Monty Waldin takes a tour round the vineyards of Europe's sexiest organic wine producer Josep María Albet i Noya

Spain is usually considered the least sexy of Europe's big four wine producing countries, coming after Italy whose lust for phallic-shaped bottles seemingly knows no bounds, France where 'la passion' and wine are perennial bedfellows, and Germany – whose latest wine advertising campaign featured buttocks and bosoms rather than bunches of grapes.

Yet Spain boasts arguably Europe's sexiest organic wine producer in Josep María Albet i Noya, sexy being defined here by wine style and wine price rather than by Albet i Noya's ponytail, shag-pile chest, inviting chestnut eyes and husky Catalan accent.

The Catalan accent and name come from the fact that Albet i Noya is based near Barcelona in Spanish Catalunya. Here, still wines carry the name of the local Penedes region while sparkling wines get the generic 'Cava' designation.

In 1980, the family-owned and run

Albet i Noya was the first Iberian winery to go organic, before the Spanish (or even French) government had recognised the term 'organic'.

Personal conviction lies at the heart of Albet i Noya's choice of organic over conventional production. 'You are what you eat,' he says, 'whether you are a vine or a human being. What you put into the soil in a vineyard is what you get out of it as grapes come harvest time, and thus as wine once fermentation has finished.'

In other words, Albet i Noya avoids all those things allowed in conventional vinegrowing such as systemic fungicides, chemical fertilizers, pesticides, and insecticides in favour of organic compost for the soil and gentler vine sprays like inert soaps and salts to make more wholesome grapes and more wholesome-tasting wines.

The 'you are what you eat' theme recurs in the fact that all Albet i Noya wines are also suitable for vegetarians and vegans, as Josep María prefers not to eat meat.

'Many consumers often wrongly assume that all organic wines are vegan or vegetarian suitable,' he says, 'when in fact a number of animal-based winemaking aids are allowed under organic rules.' These include egg albumin, casein from the dairy industry, gelatin from animal

bones and isinglass which is derived from fish. These animal by-products are used as a wine fining agent, either to make the wine colour brighter or to make the flavour of the wine smoother tasting.

'These animal products are classed as winemaking aids rather than additives,' explains Josep María, 'meaning that they do not stay in the wine but are instead removed before bottling, but we prefer not to use them at all.'

Josep María's winemaking is very modern in style, meaning wine flavours are tropical, juicy and overtly fruity, rather than restrained, mineral or earthy and oak flavours are bold too, in line with most modern consumer tastes.

What makes Albet i Noya more distinct though is the fact that as well as growing around 40 hectares (100 acres) of their own organic grapes at their 700-year-old Can Vendrell estate, the family also buys in organic grapes from around a dozen other local Penedes growers.

'This contributes more potential complexity to the wines when they are blended,' says Josep María, 'because we may be getting Tempranillo grapes from six different soil types, or Chardonnay grapes from three vineyards at different altitudes which ripen at different speeds.'

There is also another positive aspect to buying in grapes, for it allows smaller

organic vineyards without the structure to ferment, bottle and commercialise their own wines to survive.

For example, one five-hectare (12.5 acres) vineyard supplying Albet i Noya with Syrah, Cabernet Sauvignon, Grenache Noir and Merlot is owned by four sisters. 'All four sisters are teachers, and they work the vineyard after finishing work at 5pm,' says Josep María. 'It is almost like they treat their vineyard as a garden, carrying on a family tradition as the vineyard belongs to their father.'

Purchasing grapes like this allows Albet i Noya to minimise its overheads and thus stay competitive in terms of price. Spain's benign climate makes organic production much simpler than in Bordeaux or Champagne, for example, and means that Spain can produce some of Europe's best-value organic wines – or 'wines produced from organically grown grapes' to give organic wine its legally defined term within the EU. Albet i Noya is no exception.

■ Monty Waldin, author of the world's first biodynamic wine guide, has spent years familiarising himself with the complexities and vagaries of organic and biodynamic wine production



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WINE RECOMMENDATIONS

Please note: all Albet i Noya's wines are vegan (and thus by implication vegetarian) suitable.

SPARKLING

Cava Can Vendrell

£7.20 Vintage Roots; £7.49 Vinceremos.
Dry white sparkler made from the Cava purists' favoured grape blend: Parellada, Macabeo and Xarel-lo.

Cava Rosat

£8.99 Vintage Roots
Dry pink sparkler made from early picked Pinot Noir grapes..

Cava Brut 21

£11.50 Vintage Roots; £11.99 Vinceremos
£29.50 (magnums) Vintage Roots
Dry white sparkler made from the citrusy Parellada grape and the more tropical-flavoured Chardonnay.



£11.25 Vintage Roots.

From Albet i Noya's oldest Chardonnay vines, barrel fermented from only the first juice running out of the wine press.



STILL RED

Can Vendrell Penedès Tinto Cabernet Sauvignon/Tempranillo

£5.20 Vintage Roots; £5.29 Vinceremos.
Dry unoaked red with lovely balance of Tempranillo and Cabernet Sauvignon.

Albet i Noya Penedès Tinto Tempranillo Classic

£5.69 Vinceremos; £5.99 Vintage Roots.
Great value juicy red that needs guzzling.

Penedès Tinto Lignum Negre

£6.75 Vintage Roots; £6.99 Vinceremos
Solid wine for meaty main courses.



STILL WHITE

Can Vendrell Penedès Blanco Chardonnay + Xarel-lo

£4.90 Vintage Roots; £4.99 Vinceremos.
Tropical, cool fermented, unoaked Chardonnay and Xarel-lo grapes are given extra spice from earthy Macabeo and aromatic Sauvignon Blanc grapes.

Albet i Noya Penedès Blanco Lignum Blanc

£6.75 Vintage Roots; £6.79 Vinceremos.
Clever blend of barrel fermented Chardonnay for a weighty mouth-feel and stainless steel fermented Sauvignon Blanc to keep it lively enough for food.

Albet i Noya Penedès Blanco Chardonnay Col.leccio

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HOW LOUD DOES THE EARTH HAVE TO CRY?

We interrupt our regular programming for a moral advisory...

This spinning ball of blue water with the lovely clouds on it – she floats in space and is blooming with life. It is the most beautiful thing. I have that picture they took from the moon fixed in my mind, and then, and then – that same water shoots through my window and pulls me out into my whitewater street in a swirl of dead neighbours. That's easy to picture as well, because I lived in the Latin Quarter in New Orleans in my youth.

With that nightmare of Katrina, the first thought I have, I'll admit, is of what techno-daydream might save me at the last moment. When will the submarine stocked with a fortnight of food appear?

We have begun a discussion with the Earth in which we can no longer expect anything less than a 150 mile an hour reply to come shouting down our street and through our window. That shout has come to us in other forms, other languages, like frogless mountains, cancer upon cancer upon cancer, autumns done in the wrong colour... and we can expect ever more savage shouts to join in now. Perhaps there was a time when we were assigned the task of catching the more nuanced news from the Earth, but we did not listen in time. For late stage capitalism is a Visigoth with a personality disorder, I'm afraid.

This post-Katrina meditation is a difficult one. We look for the relief of comic distractions, like our sad fun in watching the Bush thugs run around like Keystone Kops. But there is danger in blaming them. It has become so delicious a game for Lefties to fling instant jihads against the Christ Cowboys. That is not a powerful enough shout. People who read a magazine like *The Ecologist* can

laugh and say I Told You So right into the teeth of the storm. But gallows humour takes on a new and hollow ring when one realises that there is a rope around one's own neck too.

After Katrina, there is no loyal opposition. Liberal celebrities and Democrats are ranting, trapped in an abandoned history. Katrina has tripped such role-playing into the abyss. No, these are not promising careers just now, with two new hurricanes in line east of Miami, and with floods in Germany, fires in Portugal and the massive echoes of the tsunami still circling the angry Earth... it's time to step back from 'the spinning ball of blue water', clear our minds completely and start over.

Maybe that is too hard. The momentum of pop rubble, gods, the pixels of money and style, the cravings of loneliness and liberalism and satiation by false advertisement in its thousand forms – do we really hope to begin again while we drown in this incandescent counter-flood? Katrina decided not to be a traditional hurricane, and to be effective environmentalists we will listen to her... and not be traditional members of that noble calling – the Environmental Movement.

Now THAT is a radical meditation. If I really found myself alone, and asked for an original thought in the quiet of my meditation, my first question might be: 'Do I want to be here?' And then I might find that – YES I want to live among the



living. I want to live. And that I want to say this with a force greater than the Environmental Movement. More along the lines of Katrina. A voice with the 150 mile an hour force. But first, there is another question I must ask. It is a shadow question, too. It might be: 'Does this place want me here? This spinning ball of blue water, with the lovely clouds on it, floating in space and blooming with life? Does it want me here? DOES IT WANT MY LIFE?'

There is another, more difficult question I must ask: 'Does the Earth want me here? Does it want my life?'

I am alone with this blue ball of water... I sit in this chair and imagine you floating in my window. Katrina! I gaze at your beauty and I also feel fear, a panic that you will come through my window and pull me to my death. And I won't have time, in my haste, for all those who invented my life. I fear the inventors of jazz and

the delta blues and the sanctified church and Mardi Gras. I leave them all behind, and call them criminals as they drown in the darkness.

But what if I don't fear you? If I don't fear you... If I love you, then I will hear your music coming from my neighbours, and I will save them and they will save me. Give me a powerful preaching cry! – only the Earth can make a great voice now. Change-a-lujah!

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