

Year in review



Unsold inventory . . . imported cars wait unwanted at the Port of Newark, New Jersey, US Mark Lennihan/AP

Sub-prime defaults and toxic debts produce a Great Recession

Governments had to recapitalise and part-nationalise banks, industrial and retail giants went bankrupt and unemployment kept rising worldwide

Finance
Heather Stewart

The credit crunch devastated livelihoods around the world in 2008. It began with US sub-prime borrowers struggling to repay their mortgages, then the trouble moved outwards, creating waves of financial crises, and shaking the long-established economic order to its foundations.

As the year began, the chaos seemed safely confined to the financial centres of New York and London, and those countries, including Spain and Ireland, that had experienced housing booms over the past decade, and were now watching them bust. Banks on both sides of the Atlantic scoured

their books for complex toxic assets that had seemed a work of financial genius, and were now worth next to nothing. Homeowners in many countries who had benefited from cheap borrowing watched the value of their properties begin to slide.

As the months went by, it became clear that the sub-prime mortgage crisis had seriously damaged financial systems on both sides of the Atlantic. The emergency nationalisation of Northern Rock in the UK in February, and the forced marriage of Wall Street investment bank Bear Stearns with its rival JP Morgan in March, brokered by US Treasury Secretary Hank Paulson and backed with \$30bn in public money, symbolised the way that the banking Masters of the Universe were humbled by the crisis. Politicians in

emerging economies found it hard to avoid schadenfreude, watching the western governments that had preached liberalisation, open markets and light-touch regulation turning to nationalisation and state intervention to rescue their fragile banks.

Until the summer, many economists still held to the comforting theory of decoupling – the idea that new powers such as India and China were finally strong enough to sustain the global economy, even as the US slipped into recession. The conviction that demand from emerging markets would continue, even as the rest of the world crumbled, helped to keep the costs of raw materials, including oil, steel, and even food, at high levels for much of the year.

For exporting countries, such as

the oil states of the Arabian Gulf, high prices meant multibillion-dollar windfalls, and the return of talk about petrodollars sloshing around financial markets; but the rising cost of food and fuel pushed many poorer nations into severe financial trouble. There were food riots in many countries, including Haiti, Mexico and India.

Robert Zoellick, president of the World Bank, had a bag of rice and a loaf of bread at a press conference in Washington in April, to warn that high food costs could set back the global fight against famine by up to seven years. He pointed out that wheat prices had risen by more than 120% over the past year, and the cost of rice, a staple in many countries, by more than 75% in just three months: "While many worry about **Continued on page 2**"

Year in review

Sub-prime defaults and toxic debts

«Continued from page 1 filling their gas tanks, many others around the world are struggling to fill their stomachs. And it's getting more and more difficult every day.»

An emergency food summit of world leaders in Rome, in June, produced exhortations for a long-term increase in agricultural investment in developing countries and few immediate solutions.

For a few weeks over the summer, the financial crisis seemed in abeyance and politicians turned their minds to other problems. In July there was an opportunity for governments to demonstrate that they were still committed to open markets, as ministers from 30 countries gathered in Geneva to seal the long-running Doha round of world trade talks.

For several days of discussions, a compromise appeared to be within reach. But behind the closed doors of the "green room", where the most intensive talks took place, India and China became locked in a dispute with the US about what safeguards developing countries could use to protect their farmers against sudden surges of subsidised imports from rich countries.

The talks broke down acrimoniously, and Susan Schwab, the US trade representative, stumbled down the grand stairway of the World Trade Organisation's headquarters and revealed to reporters that for the time being, the Doha Round was over. Indian trade minister Kamal Nath insisted that he had represented the interests of many millions of subsistence farmers; the most important thing was livelihood security, the vulnerability of poor farmers, which could not be traded off against the commercial interests of the developed countries. Schwab described the stance of India and China as "unconscionable".

WTO director-general Pascal Lamy is still trying to build a consensus, but with many governments busy fighting

financial crisis, few developing countries are pinning their hopes on significant progress in the near future.

In the US, Washington began chucking public money at the crisis. Ben Bernanke, the Federal Reserve chairman and former Princeton professor whose academic specialism was the Great Depression, was anxious to prevent cash-strapped banks from starving businesses and consumers of credit, plunging the world's largest economy into a deep recession.

In July, Paulson received permission from Congress to rescue the massive state-backed mortgage lenders, Fannie Mae and Freddie Mac. By September, Wall Street was reeling and there were rumours that venerable investment bank Lehman Brothers was in serious trouble. As its share price came under attack, and anxious investors withdrew funds, global observers began to speculate that once again, Paulson would have to open the government's cheque book. But this time, Paulson believed that Lehman had been badly run, and when the only potential rescue bidder, Barclays, walked away, the US government decided to let the bank go. At midnight on Sunday, September 14, Lehman filed for bankruptcy.

This provoked the worst panic of a terrified year. Well beyond the financial sector, firms around the world reported that business fell off a cliff after that day. Most investors had assumed that Lehman was too big to be allowed to fail, so enmeshed in markets around the world that the government would bail it out for fear of the consequences. It was not so, and the resulting panic forced observers everywhere to think the unthinkable about the damage the credit crunch could cause to businesses and their employees.

In October, as the share prices of banks were the source of almost daily panic, a shaken Paulson demanded a \$700bn blank cheque from Congress to fund his troubled assets recovery programme, TARP, a scheme to buy up toxic mortgage-backed assets from struggling banks.

After several days of haggling, Paulson got his money, but not before debate in Congress had exposed how radically US politics had been transformed by the crunch. In the US the rich had always been lauded for their success, not envied or despised. But with thousands of poor families being thrown out of their homes, the angry public on Main Street made clear to their politicians that they saw no reason why the banks should be bailed



Beijing's post-Olympic opportunities

Chinese businessmen and local officials have flooded to Beijing, but there may be less money to go around than they hoped after the \$586bn stimulus package was announced in November. What is available will not necessarily be spent on new projects. Only 25% of the total package will come from the central government. Another 25% is supposed to come from cash-strapped local governments, with state-owned enterprises and banks expected to fund the rest.

Beijing has outlined 10 priorities, including railways, roads and affordable housing. Yet analysts say some of those projects – such as rebuilding the Sichuan earthquake region – would have been funded even without the stimulus.

That has not deterred applicants from descending on the government offices of the National Development and Reform Commission in Beijing. Within it are the men and women who decide how to parcel out money to projects that, they hope, will help keep China's economy afloat over the next two years.

Although the stimulus plan addresses China's short-term



Economic stimulus . . . the new Beijing-Tianjin intercity railway

economic needs, it does not directly answer the question of how to increase China's consumption and domestic demand. Analysts say that issue is critical to the US-China trade imbalance and to the longer-term outlook for the world economy.

"These large infrastructure investments, aside from the fact that there'll be a huge amount of fraud and waste, aren't likely to be the most efficient way of transforming the Chinese economy," said Michael Pettis, a finance professor at Peking University. "Most people would argue that the most efficient way of boosting demand is by boosting household consumption."

Lauren Keane *Washington Post*



Lehman Brothers' collapse provoked the worst panic of a terrified year





Idle cranes . . . construction sites the world over – this one is in Gurgaon, India – have been halted by the financial crisis Gurinder Osan/AP

out. And the Paulson plan, as it became known, failed to halt declines in financial markets. When finance ministers and central bankers gathered in Washington for the annual meetings of the International Monetary Fund and World Bank, the challenge of alleviating global poverty was ignored for urgent talks on stock market declines. Light-touch regulation was out, state intervention and nationalisation in.

Other countries began to feel the effects. In Iceland, recently a financial powerhouse, three major banks collapsed, taking the savings of ordinary people and of institutions (among them British universities and local governments), nationally and internationally. It was forced to ask for a bailout from the IMF, the first developed country that has done so since Britain in 1976.

It was quickly followed by Hungary and the Ukraine; other central European governments still look vulnerable. Investors who had been scouring the world for lucrative opportunities in rapidly expanding countries are now pulling funds back home. Dubai's extraordinary property and construction boom faltered, along with some of its financial firms.

When the world's central banks

joined to battle recession with co-ordinated rate cuts in October, the People's Bank of China took part. This was an unprecedented signal that China had joined the international club, and also an indication of Beijing's nervousness about the fragility of its economy, as many factories that had exported manufactured goods chiefly to the US and Europe began to go bankrupt, leaving migrant workers stranded and provoking unrest. Later, China announced a fiscal stimulus package, a public spending splurge: the same approach taken by many other governments, including Britain. As the Nobel prizewinning economist Paul Krugman noted, few public spending projects anywhere are sufficiently advanced in their development to provide actual jobs before late 2009.

While share prices, the early-warning signs of economic trouble, have been in freefall for months, the real economy effects of a downturn, such as unemployment, are now clear. More than half a million workers lost their jobs in the US in November alone.

By the end of the year the Eurozone and Japan slipped into recession, and commodity prices were plunging, as the darkening outlook for the world's

Romanian retrenchment

Bogdan Boca, 44, a radiologist from Bucharest, took out a loan of 20,000 Swiss francs (about \$17,400) two years ago to renovate a log cabin in the Transylvanian mountains. Now, with the leu weakening, it has become more expensive for Romanians to pay off foreign debts. Boca works extra hours to keep up his payments.

Across Romania, many people are now afraid to borrow, slowing the property market and car sales. The biggest problem is the current-account deficit. Much of its money comes from the estimated 2.5 million Romanians – more than 10% of the population – who work in countries such as Italy and Spain. But with those economies now suffering, many emigrants will return home empty-handed.

Speculators have attacked the local currency; the stockmarket has dropped by 70%. Some analysts said the EU needs to provide more support to Romania and its neighbours to ward off meltdown.

In October, President Traian Basescu pinned the blame on "corrupt" outsiders. "There were smart guys, who had studied at Harvard and Oxford, and they invented how to increase the value of one's shares without actually having money," he said. **Craig Whitlock**
Washington Post

richest consumers made it less likely that demand for goods and resources everywhere would remain impervious to the downturn.

After rocketing to more than \$140 a barrel, oil prices plummeted below \$50 by December, but motorists everywhere were still doing less motoring.

Banks worldwide have been withdrawing credit, despite governmental pressure, and refusing to pass on national rate cuts; consumers have reduced discretionary spending, causing some retailers in the US and Europe to declare bankruptcy after unprecedented discount efforts to attract shoppers did not reverse slumping sales figures. The world's carmakers have been left with a massive inventory of unsold vehicles as sales of new cars dropped by around 30%, and the US "big three" – GM, Ford and Chrysler – are in line for a bail-out of billions from the government. They say they need it just to stay in business while they restructure and downsize (and they say this is the only way to avoid to avoid 2 million more unemployed).

The IMF is now sure that 2009 will see the first outright contraction in economic demand right across developed countries since the end of the second world war, and globalisation means that when the rich world suffers, so do the poor.

Alternative model thrives

Patrick Butler

Europe's biggest social bank, Triodos, whose mission is to "make money work for positive social, environmental and cultural change", is thriving. Its most recent half-year results show a healthy growth in balance sheet and profits. "Credit crunch bypasses Triodos" was the bank's message to shareholders. In global terms, it is a minnow, its total balance sheet was \$2.6bn in June 2008. But when credit is scarce, Triodos is preparing to step up its investments.

Charles Middleton, Triodos UK managing director, puts its success down to a "sound" model of banking: operating in the "real" economy (and avoiding complex financial instruments), eschewing high levels of debt and resisting pressure for short-term profit maximisation. As Middleton says, "sustainable investment has worked" for Triodos. The list of its UK investments includes wind energy companies, organic farms, housing co-ops, arts projects, fair trade shops, social care charities, social businesses, even Buddhist centres. It financed the first containers of Cafédirect coffee to arrive in the UK in 1990, and 14 years later raised \$7.5m for the company through Britain's biggest ethical public share issue.

Its double bottom-line approach, using depositors' money to make a profit by investing in businesses that create a positive and sustainable social and environmental impact, is now looking like a model of how mainstream banking might adapt. A "different way to do business" is a theme that emerges again and again. Triodos's strict approach to investment is a shrewd, as well as enlightened, approach to risk.

There's a rigour to the way it sizes up business loan applicants that seems eminently sensible. Middleton says he is as surprised as most people at the scale of the crisis in the banking industry, but not shocked that the Triodos model has so far weathered the storm. Its sustainable approach to lending is matched by a governance structure that guards its mission and independence, and prevents volatile speculation in its shares.

Triodos has not been entirely unaffected by the downturn: the recession will mean tough times for many of its customers, says Middleton. A tightening of consumer belts may affect the market for organic and fair trade produce. But the businesses tend to be less profit-driven, more resilient, less loaded with debt and not so exposed to the volatility of the markets.

Year in review

Farewell to America's role as the world's sole superpower

International relations Julian Borger

The two events that did most to change the face of the world in 2008 are densely intertwined. Barack Obama might well not have been elected president in November without the global financial meltdown less than two months earlier. Conversely, the deep recession that is coming in its wake will shape the Obama presidency, sharply limiting his room for manoeuvre.

Obama's victory is obviously a decisive breakthrough for race and society in the US, but it will also have a galvanising impact on America's relationship with the rest of the world. Obama was favoured over his Republican opponent, John McCain, in all but a small handful of nations around the world. Europe sees an Obama White House as an opportunity to redraw the transatlantic relationship on more egalitarian and multilateral lines. Africa is thrilled to see a president it considers one of its own sons in the Oval Office, and the Arab world has hopes that an American with the middle name of Hussein will be more sympathetic to its cause than his predecessor.

Obama's multilateralist instincts

are informed not only by the evident failure of Bush-style diplomacy; they also reflect the changing environment America finds itself in. After the election, the US intelligence community published a report looking ahead to 2025. The principal finding was that the US would no longer be the world's sole superpower, but would instead be the strongest of several world powers in a multipolar world. Furthermore, the triumph of western democracy is not inevitable. The financial meltdown has combined with the war in Iraq to further hasten the end of America's "unipolar moment" that dates back to the end of the cold war.

Washington's diminishing clout was clearly demonstrated in August by the Russian invasion of Georgia. It was an act of stinging defiance of the US, which had presented itself as Georgia's distant protector. At the Nato summit in Bucharest in April, Bush had pushed hard for Georgia and Ukraine to be awarded Membership Action Plans, an important step towards eventual entry into the alliance. He fell short, but persuaded his allies to making a declaration guaranteeing eventual membership.

The immediate trigger for the invasion was Georgia's military incursion into the pro-Russian breakaway region of South Ossetia, but the Rus-

sian response, pushing to the Black Sea and to within a few kilometres of Tbilisi, was clearly intended to quash Georgia's Nato aspirations. Many declarations were subsequently made in the west in solidarity with Georgia, particularly by the US and Britain, but there seems little doubt that the invasion further frightened already sceptical European Nato members who questioned the wisdom of the alliance recruiting a new member it could not defend.

The Georgia conflict also dispelled any hopes in the west that Russia's new president, Dmitry Medvedev, would prove easier to work with than Vladimir Putin, who became prime minister when Medvedev was inaugurated in May. Any residual western optimism that Medvedev was a dove was put to rest by his first address to the Russian parliament in November. He pledged to deploy missiles in Russia's Baltic enclave of Kaliningrad as a riposte to the planned siting of America's own missile defence system on Polish and Czech soil.

America's other great power rival, China, also appeared to reveal a softer side in the government response to the May earthquake that killed about 70,000 people in Sichuan province. The army responded rapidly, and the premier, Wen Jiabao, arrived at the site of the disaster within hours. He shouted encouragement to trapped survivors telling them that "Grandfather Wen" was there to save them.

However, hopes that this populist gloss reflected a new sensitivity to the will of the people were stifled three months later. The breathtaking architecture of the Olympic stadia was made possible by a programme of forced removals and demolition. There were areas set aside for protests during the games, but those who applied for permits were arrested.

Significant and positive change was hard to find around the globe in 2008. There was short-lived rejoicing over the return of democracy to Pakistan. Civilian parties won the February elections, avenging the assassination of Benazir Bhutto two months earlier. The victors eventually formed a coalition government and forced Pervez Musharraf to resign in August, nine years after a military coup brought him to power. Democracy, having failed Pakistan so many times before, was being given another chance. The new president, Asif Ali Zardari, Bhutto's widower, instilled new life into dialogue with Afghanistan, and with India.



Life is sweet in piracy capital

Dhows rest on a white beach in front of a few dozen ramshackle homes. A creek cuts inland, traced by a dirt road that runs to a craggy fishing settlement 3km away. Until recently Eyl was a rundown Somali fishing outpost of 7,000 people. Now, thanks to some spectacular ocean catches, it is a mini-boom town, awash with dollars and boasting a new notoriety as the piracy capital of the world.

In a war-ravaged country each successful hijack brings more young men into the village to seek their fortune at sea. "Even secondary school students are stopping their education to go to Eyl because they see how their friends have made a lot of money," Abdulqadir Muuse Yusuf, the deputy fisheries minister for the Puntland region, said.

The pirate kingpins splash their money around and when a ransom is received the hijackers join in the splurge, much to the pleasure of long-time residents.

One successful pirate based in

Garowe, 160km west, Abshir Salad, said: "First we look to buy a nice house and car. Then we buy guns and other weapons. The rest of the money we use to relax."

The pirates appear to have little fear of arrest by the administration, whom many suspect of involvement in the trade. By spreading the money to local officials, chiefs, relatives and friends, the pirates have created strong logistical and intelligence networks, and avoid the clan-based fighting that affects so much of the rest of the country.

Xan Rice and Abdiqani Hassan
Bosasso



Done with fishing... Somali pirates

Failed states may be as big a security worry for Obama as rogue states were for Bush

The attempt to open a dialogue with the elders in the tribal areas has done little to stem the flow of insurgents, widely believed to have backing from at least some elements in the intelligence service, from the border region into Afghanistan. That has angered the government in Kabul and the US-led coalition forces, who have stepped up cross-border air strikes and at least



New world order . . . students in Senegal dance in front of giant puppets of Nicolas Sarkozy, left, and Barack Obama Rebecca Blackwell/AP

one raid by ground troops. The attacks have in turn served to undermine the Pakistani government's standing at home.

Worse was to come towards the end of the year. The Mumbai massacre abruptly stalled the Indian-Pakistan thaw. India claims the shocking assault was planned inside Pakistan by an extremist Kashmiri group, to which the intelligence services also have deep and long-standing links.

Elsewhere in the world there were elections that failed to deliver as much change as they once promised. The historic victory of Zimbabwe's Movement for Democratic Change in March momentarily looked like it would end Robert Mugabe's 28 years in power. But the country's election commission insisted on a second round presi-

dential poll, which was preceded by a nationwide campaign of intimidation. Ultimately, the MDM leader, Morgan Tsvangirai, pulled out of the race to spare the lives of his supporters, and the country remains in the grip of a despotic and economically incompetent regime.

With the resumption of conflict in eastern Congo, the alarming growth of piracy off the Somali coast, and the weakening of the government in Kabul, there is every sign that the spread of failed states may become as big a security worry for an Obama administration as "rogue states" were for Bush. The change in the White House offers the chance of a fresh start in international diplomacy, but the world Obama will have to confront is getting tougher.

West fails to get to grips with instability in Africa

Human rights
Julian Borger

The year at least ended relatively well in human rights terms. On December 3 more than 100 countries signed a treaty to ban the use of cluster munitions that spew "bomblets" over a wide area and have been responsible for killing or maiming hundreds of thousands of civilians.

The US and Russia did not sign, but once 30 countries have ratified the treaty it will become part of international humanitarian law and the pressure will mount on all countries to refrain from using cluster bombs. That would not come a moment too soon for the people of the Caucasus, where both sides in the Georgian-Russian conflict in August used them indiscriminately, causing scores of civilian casualties.

Human rights groups are also provisionally putting Barack Obama's election victory on the positive side of the ledger, based on his promises to act swiftly to close Guantánamo Bay and roll back the use of harsh interrogation techniques that have strayed into torture under the Bush administration.

The prosecutor at the international criminal court has demonstrated that high position is no defence against justice by seeking the arrest of Sudan's President Omar al-Bashir for his alleged role in mass killings in Darfur.

There is a lot to weigh down the other side of the balance sheet. The unravelling of any semblance of government in Somalia following the US-backed invasion by Ethiopia has created complete chaos. The Islamists whom the Ethiopians ousted have been displaced on the streets by extremist shahab gangs. Three-quarters of the population of Mogadishu have fled their homes. The world only really took notice when the anarchy spilled over into ever more ambitious acts of piracy.

An upsurge of fighting in North Kivu province in the Democratic Republic of the Congo, following an offensive by Tutsi rebels led by General Laurent Nkunda, has uprooted a quarter of a million people bringing the total displaced in the region to over 2 million. As in Darfur and eastern Chad, the poorly protected refugees have become targets of the militias, even in the relief camps.

Once again the crisis has exposed the crippling weaknesses of UN peacekeeping. The 17,000-strong UN force, Monuc, had only 800 troops in Goma

when Nkunda attacked in October and has been powerless to stop abuses by both Nkunda's militia and Congolese troops. The UN approved the dispatch of 3,000 reinforcements, but the European Union has refused to send its rapid deployment combat brigades.

Where the west has tried to intervene in Africa, it has found its leverage to be extremely limited. No amount of British, European and US condemnation could prevent a bloody campaign of intimidation carried out by gangs loyal to Robert Mugabe, ahead of the second round of Zimbabwe's presidential elections in June. More than 40 people were killed, and hundreds subjected to beatings, including in specially created torture camps, with the result that the election became meaningless.

In all these cases of large-scale abuse, China has opposed forceful outside intervention, based on the principle of non-interference in domestic affairs. The benefits of this principle to the Beijing government were made plain in March when it sealed Tibet off from the outside world while it sent troops in to crush demonstrations led by Buddhist monks. It showed that, although China has become more sensitive about its image as it integrates into the global economy, it will not hesitate to strike hard if it feels its vital interests are threatened.

Russia's war on words

Russia is one of the most dangerous places in the world to be a reporter but Mikhail Beketov knew the risks. In a series of articles he had campaigned against the local administration in the Moscow suburb of Khimki. He had received threats. His car had been set on fire. Last summer he returned home to discover his dog lying dead on his doorstep.

Beketov continued to publish his newspaper, Khimkinskaya Pravda, but on November 11 he was attacked outside his home. He lay unconscious in his garden for almost two days until a neighbour spotted him and called the police. Assuming he was dead, the police flung a blanket over Beketov's face. Then the journalist's arm twitched. He was taken to hospital where he lay in a coma for weeks.

Russia is the third most dangerous place to work as a reporter, after Iraq and Algeria. Since 1992, 49 journalists have been murdered.

Luke Harding

Year in review

Earth teeters at its physical limits

Environment John Vidal

At the start of the year there were empty shelves in Caracas, riots in India and Mexico and rice shortages in Dhaka, Kathmandu and Manila. Traders in a dozen sub-Saharan countries were hoarding food, and soaring maize and rice prices were leading to widespread political instability.

The problem, said the analysts, was a mix of climate change, high oil prices and extreme weather leading to poor harvests in major grain growing countries like Australia. But blame was also laid on the very many millions of hectares of maize, wheat and other crops planted in the US and elsewhere in 2007 to provide biofuels for cars rather than food for people. Catastrophe loomed, said the UN.

And it happened, slowly and out of sight of the cameras, in the burgeoning cities that are becoming the new frontline of deep poverty. Proof came this month, when the UN food and agricultural organisation reported that 2008 had seen the biggest increase in malnourished people in decades. More than 960 million people – one in every six people in the world – now goes to bed hungry. Forty million extra people suffered malnourishment in 2008 because of higher food prices.

It was also the year when it may have dawned on governments that hell-for-leather, western fossil-fuel-based, car-centred growth only ends in social and ecological disaster. The boom years between 1990 and 2008 brought millions out of poverty but they also saw carbon

emissions rise to new records and other environmental problems spiral.

There was soaring air pollution from a record 622 million air passengers and near record loss of tropical forests. But climate change stayed centre stage and dominated the international agenda. A flood of scientific papers showed Arctic ice melting faster than ever and the melting of the Greenland ice sheet close to becoming irreversible.

Methane, one of the most damaging climate change gases, was found bubbling up from the tundra and the arctic ocean. There were record temperatures and near-record hurricane seasons. The images of the year were a polar bear stranded on an iceberg, and even more of the Australian interior becoming true desert.

The poor are thirsty

It also became clear in 2008 that climate change was already disproportionately hitting the people who can least tolerate it: the poor. Subsistence farmers worldwide reported increasingly unpredictable seasons and social problems linked directly to water and higher temperatures.

In northeast Brazil, which has always been drought-prone but which has seen temperatures rise at least 1C in only 30 years, more than 1.5 million people now cannot get enough water and must leave home to find work in the biofuel fields in the south. Tens of thousands never return, leaving “drought widows”. Like others in Bangladesh, Uganda, Niger, Malawi and Nepal, the farmers unanimously said temperatures were becoming hotter and rains less predictable.

But the most extreme admission of



Too late? Scientists start to say 'yes'

Climate change David Adam

At a high-level academic conference on global warming at Exeter University this summer, climate scientist Kevin Anderson stood before his expert audience and contemplated a strange feeling. He wanted to be wrong.

Anderson, an expert at the Tyndall Centre for Climate Change Research at Manchester University, was about to send the gloomiest dispatch yet from the frontline of the war against climate change. He would say that carbon

emissions were soaring way out of control. The battle against dangerous climate change had been lost.

“As an academic I wanted to be told that it was a very good piece of work and that the conclusions were sound,” Anderson said. “But as a human being I desperately wanted someone to point out a mistake, and to tell me we had got it completely wrong.”

Nobody did. The cream of the UK climate science community sat in stunned silence as Anderson pointed out that carbon emissions since 2000 have risen much faster than anyone thought possible.

In the jargon used to count the

steady accumulation of CO₂ in the Earth's thin layer of atmosphere, he said it was “improbable” that levels could now be restricted to 650 parts per million (ppm).

The CO₂ level is currently over 380ppm, up from 280ppm at the time of the industrial revolution, and it rises by more than 2ppm each year. The British government's official position is that the world should aim to cap this rise at 450ppm.

Experts say that could offer an even-money chance of limiting the eventual temperature rise above pre-industrial times to 2C, which the EU defines as dangerous. (We have had 0.7C of that



Too warm . . . water streams from an iceberg calved from the Ilulissat Kangerlua Glacier in Greenland



Controversial alternative . . . a worker collects oil palm fruits in Sepang, near Kuala Lumpur. It is prized as a source of biofuel *Bazuki Muhammad/Reuters*

oncoming climate and food problems came from Mohamed Nasheed, new president of the low-lying Maldives, who said he was looking for a new homeland for the time when his country was swamped by rising seas.

Multiplier effect

The big, still unanswered question of 2008 was how far the financial, food and ecological crises were linked. The best evidence may come from a 1972 study. A group of economists and ecologists were commissioned to predict the consequences of a rapidly growing world population, rapid industrialisation in developing countries, and growing pollution. Their famous book, *Limits to Growth*, predicted widespread and growing hunger, oil shortages and ecological and economic collapse by the mid-21st century if countries did not address the overuse of resources and ecological problems. They were ridiculed.

But this year Graham Turner, a scientist at the Commonwealth Scientific and Industrial Research Organisation in Australia, compared the past 30 years of reality with the predictions made in 1972. What he found was that everything today is in line with the book's predictions, with only the dates flexible. "The contemporary issues of peak oil, climate change, and food and

water security resonate strongly with the overshoot and collapse in *Limits to Growth*. If we do not substantially reduce our consumption and increase technological progress, the global economy will collapse by the middle of this century", he concluded.

Meanwhile, surprising evidence accumulated of the costs of losing nature. An EU study by Deutsche Bank economist Pavan Sukhdev estimated the annual cost of forest loss at between \$2tn and \$5tn. Biodiversity loss, he said, was already leading to wars and political destabilisation and could cost the world 7% of its economic wealth by 2050.

Shell economists working with the International Union for Conservation of Nature said it would cost about \$1.3tn over 30 years to protect the world's key ecosystems. For this, nearly 15% of land and 30% of the oceans would be protected from illegal logging, overfishing and pollution and would go most of the way to protecting the most endangered animals.

For much of the year it did look as though the rich world had begun to address sustainable development. Europe committed itself to generating 20% of all energy from renewables by 2020 and banned incandescent light bulbs; Britain became the first country in the world to set itself a legal target of 80% reduction in carbon emissions by 2050; and by the end of 2008 more than 70 countries had national goals for the use of renewable energy. Businesses, the UN agencies, all UK politicians and many individuals all genuinely tried to reduce emissions.

Clean energy took off and climate change mitigation became an industry backed by the world's biggest companies. According to HSBC, companies in the climate-mitigation business now generate \$300bn in revenues each year. In November the International Energy Agency predicted that renew-

able energy would overtake natural gas to become the second-largest source of power generation worldwide within two years and global wind and solar generating capacity increased by more than 30%.

Economic turbulence

In mid-year, with the oil price over \$130 a barrel and governmental talk of oil supplies "peaking", there was concern that the price could go over \$200 a barrel. As people rushed to buy smaller cars, fit better boilers and get into wind and solar, it seemed possible that the constant rise of emissions might be reversed. Yet by December, oil had dropped to under \$40.

Whether the world weans itself off oil will quite likely determine sustainability over the next 20 years. Recessions have always punctured green economic bubbles and many economists expect a repeat. When times are tight, the wisdom goes, no one invests in new or risky technologies.

That is clearly already happening in part. Plummeting demand for recycled materials, especially in China, has drastically lowered prices for old paper, plastic and metals. US and European cities were forced to scale back recycling. South Africa decided it could not afford "clean" new nuclear power stations and opted to massively increase its coal-burning stations.

But another, more optimistic, group say that the recession may not only check unsustainable growth but also provide a breathing space to move to more sensible policies. Governments, say leading greens, have before them a historic opportunity to "climate proof" their economies as a response to economic troubles. Energy gurus such as Amory Lovins, of the Rocky Mountain Institute, and Lester Brown argue there is no way back to fossil fuels.

The consensus is that 2008 appeared volatile and dangerously unpredictable, but if governments do not change, it may seem in a few years' time like the calm before the storm.



One in six of the world's population go to bed hungry and 40 million extra are malnourished



already and an estimated extra 0.5C is guaranteed from emissions to date.)

Anderson's graphs told a different story. Line after line, representing the fumes that belch from chimneys, exhausts and jet engines, that should have bent down in a rapid curve, were heading for the ceiling instead.

At 650ppm, the same fuzzy science says the world would face a catastrophic 4C average rise. And even that bleak future, Anderson said, could only be achieved if rich countries adopted "draconian emission reductions within a decade".

Many scientists, politicians and campaigners privately admit that 2C is a lost cause. Ask for projections around the dinner table after a few bottles of wine and more vote for 650ppm than 450ppm as the more likely outcome.

The escalating human emissions could not have come at a worse time. The Earth's forests and oceans could be losing their ability to soak up carbon. Most climate projections assume that about half of all carbon emissions are reabsorbed in these natural sinks. Computer models predict that this effect will weaken as the world warms, and a string of recent studies suggests this is happening already.

The Southern Ocean's ability to absorb CO₂ has weakened by about 15% a decade since 1981, while in the North Atlantic, scientists also found a huge decline in the CO₂ sink. The ability of forests to soak up anthropogenic CO₂ is also weakening, because the changing lengths of the seasons alter the time when trees switch from being a sink of carbon to a source.

Israel pilots electric car network

An American company is to install thousands of recharging points for electric cars across Israel, ready for commercial use by 2011.

Better Place showed off its first charging spot this month above a shopping centre in Ramat Hasharon, near Tel Aviv. It will install 500 by the end of this year in cities, including Tel Aviv, Haifa and Jerusalem. It expects to have 500,000 by the time the first cars – supplied by Renault-Nissan – are marketed.

Moshe Kaplinsky, head of the firm, said it believed it presented a fundamental challenge to petrol-driven cars. "This vision is to stop this addiction to oil," he said. "The

profits of oil, we know where they go," he said. "In some places these profits finance terror."

Better Place, based in Palo Alto, California, has signed deals for networks in San Francisco, Hawaii, Denmark and Australia, but the Israeli project is seen as its pioneer.

It expects a lithium-ion car battery to last for 170km. Given Israel's size, the company expects relatively little need for changing batteries. A return trip from Jerusalem to Tel Aviv covers 120km. For longer journeys, changing stations will be set up across the country and will replace a car battery within minutes. **Rory McCarthy**

Year in review

Cloud is the next big thing on the horizon

Technology
Charles Arthur

Two events in 2008, geographically far apart, showed how much the world has changed, and how little.

Many reports on last month's Mumbai terror attack were posted by ordinary people on the streets. They sent messages from their mobile phones to services such as Twitter, which lets one person broadcast thoughts around the web, in effect around the world.

One photographer uploaded his pictures from the street not to a news service, but to Flickr – the photo-sharing site where anyone can see them. Earlier that month pictures of Barack Obama's triumphant night in Chicago were similarly uploaded.

Meanwhile in Zimbabwe, an outbreak of cholera that has killed hundreds demonstrated that basic technology – for water filtration and sewage – is still an essential of civilisation of which there are no guarantees.

The past year was expected to see the "One Laptop Per Child" (OLPC) XO machine – designed to be child-sized, with software that would be child-friendly – conquer developing countries. Instead Nicholas Negroponte,

Skype prospers

Skype, which offers free internet telephone and video calls to anyone with a broadband connection, has not only survived five years but appears to be flourishing. Like Google, it has become a verb: people say "I'll Skype you".

Skype's business appears to be prospering, with a claimed 330 million users, enough to produce income of \$137m in the most recent quarter with a good profit margin.

But it has downsides. Calls are routed mainly from computer to computer so you have to be in front of a terminal (though SkypeOut will link you to outside phones). More seriously, it is a proprietary system pitching to become the default world standard. It is incompatible with open standards such as Truphone.

The prospect of the world being divided into proprietary and non-proprietary telephone systems that can't talk to each other is not reassuring. That would be a giant step backwards. **Victor Keegan**

the computer scientist and founder of OLPC, discovered that it was much harder than he had expected to persuade governments to spend huge amounts of money on educational computers.

But although the XO was not as widely adopted as expected, it did prompt a new market: the "ultraportable" or "netbook", with a small screen and low price. Scores of different models have now been made. They are a hit in the west and are showing promise of taking off in the developing world too. More generally the development by Intel of its Atom processor – which uses only five watts, compared with 30 or more for most other computer processors – points towards a future of cheap computers with long battery lives.

Meanwhile on the wider internet, Google tightened its grip on net searches. The majority of searches, in almost every country, except China, are through Google. And it has won some important battles too. One in particular was with book publishers who tried to block Google's attempts to scan the contents of every book ever published and make extracts available when people search on words contained in it. If publishers find low-cost ways of reprinting, it could mean that no book will ever truly go out of print. And for people in developing countries unaware of or unable to get hold of books published elsewhere, it is potentially of huge benefit.

More generally, the development of the "cloud" – where documents and files of all kinds are stored somewhere online, though nobody minds, or knows, where – has progressed rapidly. Users are now able to hire computer-processing power by the penny in the same way as you might buy electricity. It also makes global collaboration simple: you write your document, store it in the cloud, and give colleagues the web address so that they can find it. It's not just a paperless office; it's the officeless office.

It also opens up a world where anyone can create a company that grows in direct proportion to its customer base. Twitter, the microblogging service that limits its millions of users to 140 characters per message, uses Amazon's S3 storage service, which keeps its capital costs down to a minimum.

A mobile world

The mobile phone is, however, the one single device that has made the biggest difference to the wealth of developing nations. There is a direct



Future systems . . . a guide at Singapore's new Fushionopolis science and technology centre demonstrates movement sensor fans Wong Maye-E/AP

correlation between the percentage of the population with a mobile phone and the growth in a country's GDP. (Which comes first is more difficult, but the two definitely strengthen each other.) Mobile phone usage is forecast to pass 4bn by the end of 2008, more than half of the world's population. Encouragingly, Africa and the Middle East are two of the fastest-growing areas.

And mobiles are now a means of transferring money. In many African countries, where cash machines are a rarity, and bank accounts slightly more so, mobile cash exchange via text message is robust and trusted. Dozens of operators now offer it. In South Korea half of the population uses mobile payments.

A key development is the arrival of Apple's iPhone in 70 countries this year. The iPhone is different not for its capabilities as a phone – which lag behind those of many other mobiles, such as being able to forward text messages, record video and send picture messages – but for its internet capabilities. It is in many ways the first truly mobile internet device, with a highly responsive touchscreen and a web browser that can show pages just as they look on a desktop computer. It is one of the fastest-selling "smart-phones" in the US, where its popularity has shocked rivals.

In 2009, as more people have con-

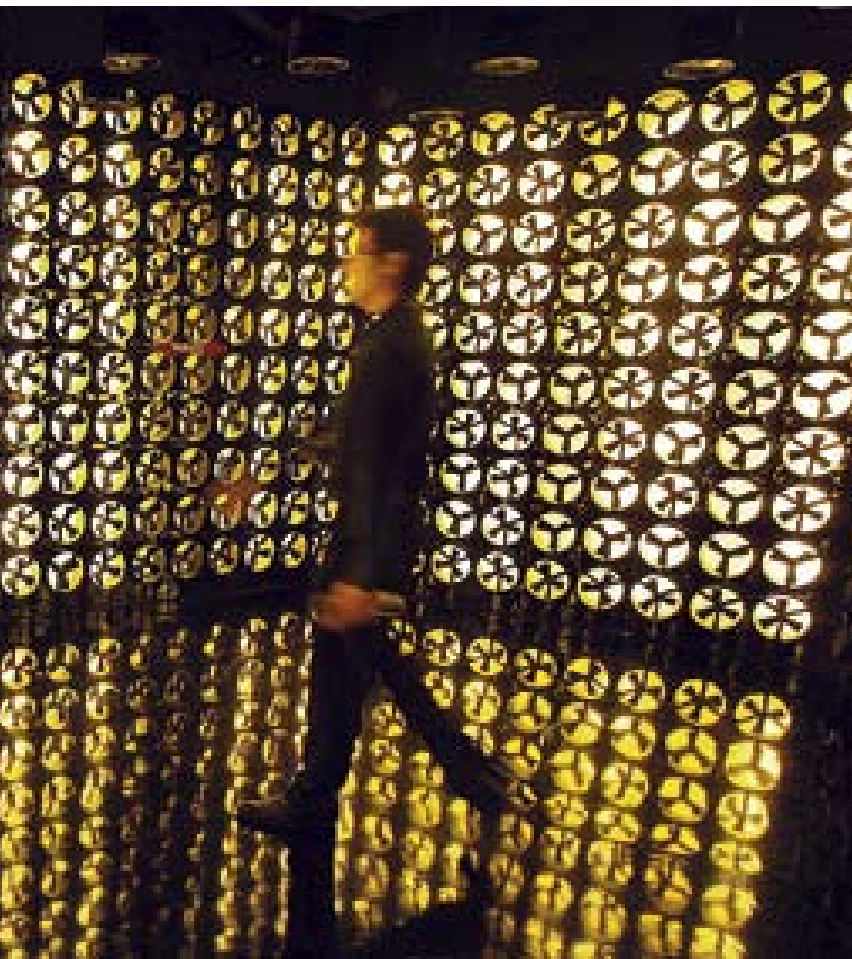
nections, mobile phones will become essential to all forms of trade. The mobile internet will start to become a reality in more and more places, changing the way we think about markets, information and "place". A Kenyan farmer may soon be able to negotiate the sale of his crop directly with a buyer in London and send a picture to confirm what he is offering. The internet will squeeze out middlemen.

Agriculture

Early in 2008 much of the talk in agriculture was about biofuels. With the price of oil having reached record levels, and after the US and EU made the inclusion of some biofuels in petrol and diesel compulsory, biofuels seemed like a sensible solution to reducing carbon emissions since they are broadly carbon-neutral. Demand for biofuels pushed up crop prices, ironically helping farmers pay crippling fuel prices.

But biofuels are inefficient to produce: the grain needed to create enough biofuel to fill the tank of a 4x4 would feed a person for a year. The biofuels equation doesn't add up. It was some relief when the oil price fell as did the price of wheat and rice, which also hit record highs in February.

But the pressure to produce more food more cheaply is making many countries look again at genetically modified crops. These can be engi-



needed to be impervious to particular herbicides, reducing the amount of spraying (and hence cost) required to grow them.

Arguments about safety and intellectual property continue. Yet their use is expanding: in India more than 1m hectares are now planted with

GM crops. Brazil and Australia are the next-biggest growers.

Albert Weale, professor of government at the University of Essex and a member of the UK's Nuffield Council on Bioethics, argued in an article earlier this year that "developing nations, struggling with widespread

poverty, poor health, limited pest control and poor agricultural sustainability, have a different risk-benefit calculation. This is perhaps why the acreage of GM crops has tripled in developing countries over the past five years, compared to just doubling worldwide." Seeds that require less labour to grow but cost more to buy might be undesirable in a country that is predominantly agrarian, but, Weale argued, in a country ravaged by Aids, labour may not be available.

In 2009 expect a greater analysis of the costs and benefits of biofuels, and even more expansion of GM crops in the developing world.

Medical science

Computing power roughly doubles every 18 months. And as decoding DNA data requires substantial computing power, it means that identifying the components of a DNA sample is getting easier and faster.

This year saw the arrival of a couple of companies, one part-backed by the mighty Google, that offered genetic testing. One, 23andme, offers "personal gene sequencing", a sort of DNA fingerprinting. But laws in the US prevent it from offering such services as "diagnostic"; they have to be presented as "educational".

The problem is that nobody is sure what identifying genes actually tells us: in parallel with faster sequencing, scientists are discovering that the interaction of genes matters just as much as which ones are present.

Nevertheless, within 20 years it's entirely possible that a baby's whole genome, about 3bn "base pairs" of DNA "letters", could be sequenced in a couple of days. The first full sequencing of the human genome, completed in 2003, took 13 years and cost \$437m.

The DNA sequencing of James Watson, one of the discoverers of DNA's structure, took only two months earlier this year. It was carried out by a company called 454 Life Sciences at a cost of about \$1m.

Such services are going to become cheaper, and more widespread. By the time we can read a genome fast, we may even understand what it is telling us.

But more prosaic challenges in medicine remain. Malaria and Aids are still two of the most widespread killer diseases, ending millions of lives prematurely. Vaccines against them remain elusive. Colombian scientists say they have developed an early-stage vaccine against malaria, but the trial stage is a long way off. A Swiss company, Mymetics, says it will have an experimental vaccine available by 2014.

Aids too offers little hope: what was thought to be a promising candidate for a vaccine was withdrawn last year, sending research back to the drawing board.

Beware the dark lining

Computing

John Naughton

If you want to track the zeitgeist, then Google Trends (google.com/trends) is a good place to start. Type in a search phrase and you get a graph showing how its popularity with searchers has varied over time.

Google Trends reveals that "cloud computing" first figures in queries in 2007. Interest grew slowly until this April, when Salesforce.com announced a deal with Google. There's another peak in July, when Yahoo, Intel and HP announced they were collaborating with several universities to set up cloud computing labs. News of a new service from Amazon produced an even bigger spike in Google searches.

Amazon offers a "service level agreement" that guarantees 99.99 per cent uptime, and four features designed to appeal to corporate IT managers: a virtual console for managing virtual servers; load balancing; automatic scaling; and intensive monitoring of the services for which one is paying.

If you believe the enthusiasts, it's nothing less than a paradigm shift. Werner Vogels, Amazon's chief technology officer, claims that the company is seeing a surge of interest – "from young businesses to Fortune 500 enterprises, from research labs to television networks" – in moving to the cloud.

A recent paper by Irving Wladawsky-Berger, for many years an eminent figure in IBM showed how the costs of providing IT services have changed. Since 1996, the proportion of cost attributable to hardware has fallen appreciably. But the percentage taken by "server management and administration" has risen from 20% in 1996 to nearly 60% today. And energy costs have gone from negligible in 1996 to about 16%.

To corporate executives facing recession, these numbers will speak for themselves. As indeed does the title of Wladawsky-Berger's presentation: "Cloud computing and the Coming IT Cambrian Explosion". The reference is geological; the Cambrian period in the Earth's development featured a staggering increase in the pace of evolutionary development, as measured by the rate at which species appeared and disappeared.

For some of our most established IT companies, Vogels's cloud may have a darker lining than they expect. **Observer**

Indian farmer suicides 'not GM-related'

Suicides among Indian farmers have not increased as a result of the introduction of GM crops, according to a large scientific study. The finding runs counter to arguments often cited by local NGOs such as Gene Campaign that oppose GM crops. They say that the supposed hike in suicides is a social consequence of farmers being forced into debt as a result of growing the crops.

Farmer suicides were recently cited by Prince Charles in a lecture via video link to the New Delhi based NGO Navdanya as one of the ills of GM technology. But the new analysis suggests that suicides among farmers have been decreasing since the introduction of GM cotton by Monsanto in 2002. "It is not only inaccurate, but simply wrong to blame the use of Bt cotton as the primary cause of farmer suicides

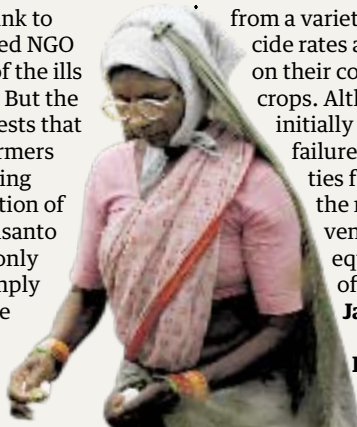
in India," said the report from the International Food Policy Research Institute in Washington DC.

"What we argue is that it's far more complex than simply adopting a technology," lead author Guillaume Gruère told New Scientist magazine. The report identifies a lack of financial support for farmers as a key problem, leading many to borrow money from loan sharks at crippling interest rates.

The researchers examined data from a variety of sources on suicide rates among farmers and on their costs and yields from crops. Although there were initially some catastrophic failures of Bt cotton varieties for some farmers, the report said that conventional varieties did equally badly because of drought.

James Randerson

Difficult trade... a cotton picker in India



Year in review

Brown prospers in turbulent times

Britain Derek Brown

Let us take our minds back to this time last year. Gordon Brown, prime minister for scarcely six months, was floundering. The Northern Rock bank had all but collapsed, and the air was thick with talk of recession and its likely dire consequences. Not much change there then, you might think.

But for all that, 2008 has been an extraordinary year of political as well as financial turbulence. As late as August there was fevered speculation that the prime minister would be overthrown by his own panic-ridden party. Labour had been routed in the local government elections in May. Ken Livingstone, the long-serving Labour mayor of London, had been ousted by Tory toff Boris Johnson. There were atrocious byelection results and a survey of marginal seats indicated that Labour would be destroyed in a general election.

It remains true that Labour is way behind in the polls. But the paradox of the past few months is that the prime minister looks the part as never before. There was even a time when the entire global banking system seemed close to disintegration, when he was said to be leading the world with his rescue plans. In his new persona as world statesman, Brown is credible again as a party leader. He gave a bravura performance at Labour's autumn conference, and was further boosted when the party, against all expectation, brushed aside a Scottish Nationalist challenge in a byelection in Glenrothes, next door to the prime minister's own constituency.

As Brown lumbered – bounce is entirely the wrong verb – back, the Conservatives wobbled. It is generally accepted that Tory leader David Cameron has been badly wrong-footed by the economic crisis. Opinion polls consistently show that even those who intend to vote Conservative think that Brown and his chancellor, Alistair Darling, are better able to handle the economic crisis than Cameron and George Osborne. The shadow chancellor, meanwhile, got himself into political hot water for predicting the rapid slide of the pound. He was right, but it led to accusations that he was adding to the crisis by talking down the currency, which duly slid further. By then Osborne had already made a bit of a wally of himself, by leaking gossip he had picked up while on holiday in Corfu. Silly boy: it came out that while on holiday he had spent time on a luxury yacht owned by dodgy Russian



oligarch Oleg Deripaska. Moreover, he had done so in the company of Peter Mandelson.

Mandelson had by that time been brought back from Brussels to the frontline of British politics, as business secretary with a seat in the Lords. It was a sensational appointment for a man who had twice been obliged to resign for improprieties, but Mandelson is well regarded in Whitehall, if not liked very much. He was once described by Simon Hoggart as the only man he knew who could skulk in broad daylight. Certainly, he handled the Deripaska episode with studied offhandedness, while Osborne was left looking silly.

Supplying the junkies in consumer rehab

When the last raven leaves the Tower of London and it is time to engrave an epitaph on the nation's headstone, there is no doubt what it will say: "Britain: the country that liked to spend now and pay later."

November's pre-budget report indicated that in the short term, the government's priority is to get through the economic emergency: to slow down the increase in unemployment, to prevent small businesses going bust and to keep people in their homes.

VAT was cut to entice consumers

Elsewhere on the political landscape the Liberal Democrats voted themselves a new leader, as is their habit. This time it is Nick Clegg, young and silver-tongued, who revealed that he had slept with around 30 women. He has a lot to learn.

Ian Paisley, who for six decades has bellowed the cause of Northern Ireland unionism, stood down as first minister of the province, and settled into his new improbable persona of a rather jolly old buffer.

We also bade farewell to an assortment of high achievers: Paul Scofield, the wonderfully mellifluous actor; George McDonald Fraser, the journalist and creator of the immortal rogue

Harry Flashman; Charles Wheeler, the finest news broadcaster of his long, long time; Simon Gray, distinguished playwright and smoker; Anthony Minghella, film director and writer, at the tragic age of 54; and Beryl Cook, who painted jolly pictures of fat ladies.

The remorseless assault on our liberties lost none of its momentum. Recent anti-terror legislation was used by Brown against Icelandic banks that went bankrupt. It was also used by one local council to snoop on parents it believed lived outside the catchment area of the school they wanted their child to attend, and by another to trace owners of dogs that had fouled the pavement. Most depressingly, the government pressed ahead with its plans for biometric identity cards, eventually to be linked to a vast databank holding health and goodness knows how many more aspects of our lives.

But '08 was not all gloom. There was the entertaining kerfuffle around Delia Smith's cookbook on how to cheat in the kitchen. Her suggested ingredients included frozen mashed potato and tinned mince. Cameron, who makes a virtue of cycling, was pictured jumping a red light and going the wrong way up a one-way street. The Famous Five books started to be reissued in a funky format, and Prince William showed us he can use his chopper by flying in an RAF Chinook to a stag bash. Ripping fun. Let's hope for more in '09.

back into the shops for a pre-Christmas splurge. The theory is that behaviour will be driven more by lower prices today than by the threat of higher taxes in the future.

But with consumers in rehab as they seek to wean themselves off their debt habit, tax cuts – even assuming they work – will prove to be the equivalent of giving the junkie another fix unless the chancellor, Alistair Darling, takes the opportunity to look beyond the short term and lay the foundations for a saner economy. **Larry Elliott**