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## CONTENTS

### » p 2 **FIGHTING COAL**

The Appalachian mountains have long been torn apart for their coal. Now, local communities fighting mountain-top removal are putting their hopes in new legislation before Congress.

**Frank Smecker** reports

### » p 4 **WILL HM GOVT BUY GREEN?**

Most of us have heard of the odd school or hospital sourcing fresh, local produce. But such stories are rare. Why is public buying of sustainable food so difficult?

Procurement expert **Maria Cross** looks at the facts

### » p 7 **MOBILE PHONES AND HEALTH**

Later this year, an Irish mobile network will launch 'Firefly' - the mobile phone for kids. With even Government advice against such a move, **Yanar Alkayat** looks at what we know for certain about mobile phones

### » p 10 **THE FIRST EVACUATION**

Earlier this year, journalist **Dan Box** documented the world's first climate change evacuation, of the Carteret islands in the South Pacific. Now he asks: if this is the first of many such moves, what have we learned?

» p 13 **Tracy Worcester's** film 'Pig Business' has met with repeated attempts at censorship by Smithfield Food's lawyers to keep it off our screens and minds...

## ONLINE NOW

» Forget the grid: Africa needs reliable, local energy

» Editor's blog: don't give up on organic food just yet

» Keeping chickens: basic tips on rearing for eggs and meat

» Behind the label: orange juice.

» Podcast: Permaculture in a small suburban garden

## Nature. Don't prod her.



**In Steven Spielberg's 1993 film 'Jurassic Park', one of visiting scientists asks the gamekeeper of the dinosaur-filled island whether the resurrected creatures exhibit signs of intelligence.**

**The gamekeeper replies:**

**'They show extreme intelligence, even problem solving... testing the fences for weaknesses. Systematically. They remembered.'**

The moral of the film - within the confines of Hollywood - is of course that nature, once roused, is not just powerful but highly unpredictable, filled with embedded systems that can, to an observer, appear as human-like intelligence.

It's just the kind of behaviour we're starting to see from the climate system, judging by some of the latest reports from scientists.

At the end of June, scientists at Monash University in Melbourne, Australia, released research showing that increased levels of carbon dioxide in the atmosphere could have the chilling side-effect of turning staple crops like cassava and sorghum poisonous - by stimulating the plant into creating higher levels of naturally-present chemicals known as cyanogenic glycosides that break down to release cyanide.

Although the cyanide only accumulates in the leaves, the scientists also found that higher levels of CO<sub>2</sub> - referred to by some as a plant 'fertiliser' - cause the plants to grow weaker with smaller edible tubers. Bad news indeed for the estimated 750 million who rely on crops like cassava for their daily calories.

Less than a month later, research by scientists at the University of California found that fruit and nut trees - frequently hailed by environmentalists as the sustainable plants of the future - could in fact suffer badly in future, warmer winters.

If the trees don't experience cool enough winter conditions they stay dormant into the spring, and then flower erratically (which hinders pollination) and fruit poorly. US farmers are already spraying orchards with hormones to induce flowering.

Not to be outdone, climate scientists based in the US released a study just days later demonstrating that the deceptively 'cool' weather (on a global level) of the last few years was in fact due to a lull in the sun's activity, and that this had effectively 'masked' the warming trend caused by increasing levels of greenhouse gases in the atmosphere. Give it a few years, the scientists said, and the mercury will rocket.

Is this Nature getting her own back? No, it's not. Are these examples of how Nature, once prodded with a stick, bites back in unexpected ways? Yes, they are.

Much like Spielberg's gamekeeper, studies like those above put us in the position of troubled observers, watching as creatures of our own creation start testing the electric fences of our science and society.

The fences may yet hold: we may breed new varieties of cassava and sorghum, almonds and cherries. Copenhagen may yet yield a ground-breaking deal. But underestimating how Nature might react to any of this would be a foolhardy mistake.

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# Fighting Coal in the USA

The Appalachian mountains have long been torn apart for their coal. Now, local communities fighting mountain-top removal are putting their hopes in new legislation before Congress. **Frank Smecker** reports

The timeworn mountains of the eastern United States, mountains older than the Himalayas, are disappearing.

The life that abounds on, around, and within these mountains is vanishing at a seemingly inexorable rate. For roughly 140 years, the summits of Appalachia have been violently exploited - entire mountaintops defoliated; ammonium nitrate detonating entire peaks into dust and rubble; the detritus of those peaks, imprudently discarded down hillsides, smothering headwaters and streams, choking the life out of macroinvertebrates, fish, and riparian growth respectively. All of this, for coal.

On a clear crisp morning, one can watch the mist lift over the crests of Appalachia, revealing clear cuts wrapping around the flanks of mountains, unveiling razed summits devoid of forest cover. It's a sore sight for eyes, and a sore subject for myriad activists crusading against Big Coal.

Judy Bonds is one such activist. Co-director of Coal River Mountain Watch (CRMW) and one of the leading voices confronting the coal industry, she has been fighting for justice in the coalfields of Appalachia since 1998. A coal miner's daughter and granddaughter, loving mother and grandparent, and recipient of the Goldman Environmental Prize in 2003, Judy Bonds got involved in activism after watching her grandson try to play in a stream littered with the corpses of dead fish. The boy also suffered from asthma which improved as soon as the family moved away from the coal dust-filled air of the mining district.

'If kids and grandkids can't play in streams, then it's time to do something,' she says. 'We're supposed to protect our children.'

## Slicing the top off

In 1977, the US Surface Mining Control and Reclamation Act was passed to ensure regulation over the environmental effects of coal mining. Section 515(c)(1) allowed for coal mining operations to practice mountaintop removal (MTR). The process is claimed to be more efficient than other methods of coal mining due to the fact that coal seams run horizontally within terrain.

Half of the US's electricity comes from subsidized coal, pumping some 2.3 billion tons of CO2 into the atmosphere every year. Central Appalachia is the country's top coal



Mountain-top removal mining in the Appalachians. The rubble left over can bury streams.

supplier in the country, next to Wyoming's Powder Basin, and has been inundated with excavation expansion, mostly (70 per cent) in the form of strip mining. Mining giant Arch Coal alone digs up 100 million tons of coal per year, roughly half of which comes via MTR in the Appalachian region.

Change is not likely to be rapid. While on the campaign trail, the Obama team received \$240,000 from the 'clean coal' lobby, and President Obama appears supportive of the industry. He told a rally in Virginia:

'We figured out how to put a man on the moon in 10 years; you can't tell me we can't figure out how to burn coal that we mine...in the United States of American and make it work.'

This doesn't wash with Bonds: 'As far as the President's policies go, Obama is better than Bush, but that isn't good enough. If Obama looks hard enough into his heart he'll abolish mountaintop removal and strip mining. If he doesn't, then he's justifying and validating Bush's previous policies, and that isn't any better than the past eight years.'

## What goes up...

When the top of a mountain is removed, the debris is scattered into valleys below. Between 1985 and 2001, there have been 6,700 of what the industry calls 'valley-fills'.

That equates to 84,000 acres of forest and watershed destroyed and/or defiled from sediment dumping.

Valley-fills can create artificial floodplains, leading to flooding in an area that wasn't naturally subjected to flooding in the past. This, combined with the inevitable leaching of heavy metals from the mine sites, leads to a dying ecology and toxic landbase. If there is a spill or flood, cleanup money often comes from the public purse.

Claims of health problems abound. Parents talk of children suffering from nausea, diarrhoea, vomiting, and shortness of breath. The long-term effects can be terminal, some include: cancers of the digestive tract, bone damage, and liver failure. To paraphrase author and professor at the University of Kentucky, Erik Reese, writing in *Orion* magazine, the above symptoms are common ailments attributed to the exposure of heavy metals found in leachate befouling the region.

Bonds points to the now accepted risk posed by coal-ash bins, which hold the thick slurry left over from the coal 'washing' process, in which water and chemicals are used to produce a product ready for use in power stations. The threat posed by the bins was highlighted in December 2008, when a similar structure at the Kingston coal power stations in Roane County, Tennessee burst and released 4.2 million cubic metres of slurry

over nearby homes and land. Progress towards abolishing them, however, is slow.

'The problem with coal-mining laws is that they only get passed after folks have died from the effects of mining,' she says. 'Even then, the laws are put in place but never enforced.'

The ecological effects of MTR are significant. Currently, two thirds of the songbirds endemic to Kentucky's Cumberland Plateau are in decline - thought to be a result of the continued use of explosives in the mining process. Estimates suggest that since the early 1970s, 320,000 acres of Kentucky, 380,000 acres of West Virginia and 90,000 acres of Virginia have been strip-mined for coal, much of it forests and watersheds.

Bonds has watched as the region's wildlife has gone into decline:

'Leaf shredders and mayflies, which are important in maintaining the health of the river ecology, are disappearing quickly. The wild boar is becoming endangered, and many of the tropical birds that arrive in the area to breed in the forest chain are disappearing as well.'

'This area boasts the world's most diverse deciduous forests - only the Amazon has a larger variety of tree species. When you destroy mountains you destroy forests. These mountains are important to the northeast. We need to stop valuing our forests and mountains in terms of dollars. A standing tree is worth more than one that has been felled to the ground.'

### A divided community

But the effects of MTR don't end with pollution and environmental degradation. There is a human price too.

'The coal industry has turned Appalachia into a third-world banana republic,' Bonds

**'In coal-producing states, Big Coal controls the media - at least 95 per cent of it. It's very common for our work to be spun by the media as "scare tactics"'**

sighs. 'The leadership here has sided with coal; most have a relative in the coal industry. This divides the community greatly, like a civil war almost - we get lots of threats and intimidation. It's basically a warzone, there are the threats and intimidation, and then the three million pounds of explosives used to blow up the mountains.'

She explains that Coal River Mountain Watch recently produced a study examining the potential for wind power on one of the region's mountains. The report concluded that a wind farm would not only provide clean energy, but also jobs as well. In response, Bonds says, the state governor produced an energy plan 'stringently reliant upon coal'.

Local media has not been supportive.

'In coal-producing states, Big Coal controls the media - at least 95 per cent of it,' Bonds claims. 'It's very common for our work to be spun by the media as "scare tactics" - that

we're threatening the employment of mine workers.'

She also believes that an apathy towards the natural world, particularly amongst the young, has allowed the situation to worsen.

'Today's youth seems to be largely disconnected from the fact that nature is very

important, in fact essential, to our lives. We need to reconnect our youth to our natural environments.'

### A silver lining?

There is hope that new legislation will help stem the tide of MTR. House Bill H.R. 1310, known as the 'Clean Water Protection Act', and Senate Bill S. 696 ('the Appalachia Restoration Act'), both aim to reduce the usage of MTR as a mining technique.

Both Bills would see an amendment to the existing Clean Water Act that would define 'fill material' as any pollutant replacing water with dry land, or reducing the water depth. This would make MTR much more difficult, as 'valley-fills' would become effectively impossible.

The legislation is progressive, but Bonds worries that the political will necessary to push them through might be lacking.

'I honestly believe that these Bills will not be passed into law unless the politicians have the courage to do so. Mountain-top removal and strip mining is as black-and-white an issue as it gets. I believe many politicians are looking for the courage to act appropriately, the people just need to put the pressure on them and that will provide the courage they need.'

Despite the deep divisions in her community, Bonds' vote remains with grassroots activists to create a 'groundswell of outrage'.

Ultimately, Bonds and her colleagues at Coal River Mountain Watch are unlikely to go quietly into the night. The group has just launched a new website - [ilovemountains.org](http://ilovemountains.org) - that allows any US resident to type in their zip code and discover how they are connected with MTR. The site is also a hub for action.

But no amount of websites or reports disguise the fact that this fight is bitter, and personal, and likely to be lengthy.

'My father and brother always said, "every law ever written about coal mining was written in our blood"', Bonds says. 'I'll always remember that quote.'

*Frank Smecker is a writer and social worker from Richmond, Vermont, USA.*



Judy Bonds started campaigning against coal mining after watching her grandson try to play in a stream filled with dead fish. She has been fighting the industry since 1998. photo: Sarah Haltom

# Will HM Govt buy green?

Most of us have heard of the odd school or hospital sourcing fresh, local produce. But such stories are rare. Why is public buying of sustainable food so difficult? Procurement expert **Maria Cross** looks at the facts

Ask those involved in public food procurement if they would like to see fresh, local ingredients on menus and they will say yes. Then they will list all the reasons why it wouldn't work.

Over 1 billion meals are served in institutions and government departments in England and Wales each year, at a cost of around £2 billion. It is easy to malign caterers for the quality of those meals, but easier still to forget that feeding people in institutions is a complex logistical exercise in which those responsible have to cater for large numbers of people within strict budgetary controls. Meals must be served at pre-determined times and maintained at certain temperatures for extended periods, all the while meeting health and safety standards. The more criteria that must be met, the greater the risk of failing to meet them. Now caterers are expected to embrace another dimension on the criteria spectrum: sustainable procurement.

The Government says that the procurement

of local, sustainably produced food is now a priority and in 2003 launched the Public Sector Food Procurement Initiative (PSFPI), to help deliver 'a world-class sustainable farming and food sector that contributes to a better environment and healthier and prosperous communities'. To achieve this aim, Defra provides, on its website, guidance

belied by other, more pressing commitments. According to the July 2008 Cabinet Office document 'Food Matters: towards a strategy for the 21st century', 'The four key concerns of food policy should be open and competitive markets, food safety, public health and the environment'. The ordering of those key concerns suggest that the free trade market

**'Small farmers and growers can be put off attempting to find a way into the public sector because of a tendering process that is protracted and laborious'**

documents for everyone involved in the food supply chain, from farm to fork. The government also launched, in March 2006, the National Opportunities Portal to bring forthcoming public sector tenders and supply opportunities to the attention of local suppliers.

So far, so supportive. Yet despite these worthy initiatives, government priorities are

has clear primacy, with the environment tagging along as an afterthought.

Perhaps that's why the PSFPI hasn't really made much of an impact. In October 2008 Defra commissioned financial consultancy firm Deloitte to carry out an independent evaluation of the PSFPI. Deloitte found that although there was increased awareness of the PSFPI initiative, it was not embedded



Buying local food is automatically assumed to be too costly for the public sector or against EU trade rules, neither of which is true.

### Case study: Rome

In 2000 an initiative was launched to improve school meals across the city of Rome. As a result, about 92 per cent of the food served is now organic and seasonal, and cooked from scratch. A typical day's food in school in Rome consists of:

**Mid-morning snack:** organic bread roll (with olives/grapes/nuts/sesame or Fairtrade banana)

**Lunch:** traditional organic lentil soup and pasta followed by: Roman-style saltimbocca (chicken wrapped in Parma ham); boiled chards with organic extra virgin olive oil and lemon juice; organic bread

**Dessert:** Seasonal organic fruit.

across the public sector and take-up was limited to isolated cases of independent efforts on the part of enthusiastic individuals to achieve its objectives.

The main problem is that buying local, sustainable food for the public sector is assumed to be either too costly or a contravention of EU regulations governing free trade. Both of those assumptions are false. With a more cost-effective model, and a little creativity, both real and perceived barriers can be overcome and procurement of local and sustainable food a realistic outcome - as evidenced by the examples below.

### Barrier: EU trade rules

The government and its agencies produce a raft of guidance documents expressing its determination to promote local, sustainable food and then solemnly reminds everyone that the EU Treaty of Rome protects the free movement of goods and services and prevents public bodies from discriminating in favour of domestic producers.

### Solution: 'creative interpretations'

In 2004 the European Parliament endorsed two new directives on public procurement that were enshrined in law in early 2006. These introduced a revolutionary change in the European regulatory context of public procurement by stating that, 'Contracting authorities may lay down special conditions relating to the performance of a contract... The conditions governing the performance of a contract may, in particular, concern social and environmental considerations.'

What these changes mean, according to Professor Kevin Morgan and Dr Roberta Sonnino at Cardiff University, who have written extensively on sustainable food procurement, is that public sector institutions, including schools and hospitals, have been given the opportunity to be 'creative' when it comes to interpreting the EU Treaty of Rome. Under EU regulations, and contrary to what many in the UK believe, food

procurers are not obliged to favour the cheapest bidder. Instead, they can choose environmentally-friendly, sustainably produced foods.

In a report published in 2007, Morgan and Sonnino demonstrate how Italy had developed a 'creative' approach even before the new directives were introduced. In 1999 the Italian government introduced a law that guaranteed the promotion of regionally sourced, organic food in public institutions, including schools. The year before, the Italian Ministry of Agriculture introduced a school education programme called 'Cultura che Nutre' (culture which feeds). Knowledge of healthy, local food production methods is considered integral to a child's education, so what is taught in the classroom is provided by the school kitchen, as part of that education. This prioritisation of values allows schools to discriminate in favour of local operators, in order to educate children on the provenance, production and cultural meaning of locally produced food and dishes. According to research carried out by the UK School Food Trust, set up to manage the recently introduced nutritional standards in this country, almost 60 per cent of Italian local authorities buy organic food. In 2003 the Soil Association reported that there were over 300 examples of organic school meals schemes in Italy.

In the UK, it's as if these portals of opportunity had never been put in place, let alone opened. No mention of Italy's example is made, or indeed ever alluded to, by any government document. Why is that?

According to Professor Morgan, it comes down to values. 'In short, the different national responses to nominally uniform EU regulations are due to the interplay of cultural values and political will in each member state. Where countries set a high premium on quality food, as in Italy, all the forces of culture and politics are mobilised to protect and promote local and seasonal products.'

### Barrier: contracts

Small farmers and growers can be put off attempting to find a way into the public sector because of the tendering process that can be a protracted, laborious affair. Contracts tend to be held by a very small number of large suppliers using a centralised distribution system with little or no regard for sustainable farming practices. Buyers often just prefer to deal with one food service company making deliveries in single drop-offs.

### Solution: cooperatives and aggregation of demand

Both food buyers and producers have much more aggregated negotiating power than they realise. One way for local producers to increase their bidding power is by forming a cooperative and submitting a collective bid. Buyers can also come together to increase their bargaining power.

The National Audit Office (NAO) claims that opportunities to come together to aggregate purchasing, and thereby obtain basic products at better prices, are routinely missed. In 2006 it published 'Smarter Food Procurement in the Public Sector' in which it highlighted variations in the price paid for the same item - for example, a wholemeal loaf of bread ranged from 32p to £1.10 and a pint of milk from 17p to 44p.

### Barrier: poorly equipped kitchens

Local food growers and producers have little chance of selling their goods if buyers are unable to purchase raw ingredients because they only have the facilities to heat up ready-

### Case study: Essex School Meals Supply Project

In 2004, four primary schools in Braintree decided to pool their skills and knowledge of food procurement in order to take control of their catering arrangements.

With the help of the East Anglia Food Link (a co-operative which promotes a more sustainable and localised food system), the schools identified local meat producers who were able to tailor their products to meet the requirements of the schools, for example by producing pure beef sausages which fit the baguettes provided by the schools. Such an arrangement could only be possible using small producers.

meals or assemble highly processed ingredients. We might like to think of public sector kitchens as places bustling with cooks in their whites, washing and chopping vegetables and tossing them into industrial-sized pots. That was once; today, most public sector kitchens do not have the facilities or the staff to deal with raw ingredients, or the storage facilities to keep them fresh.

### **Solution: in-house catering with on-site kitchens**

Institutions and other public sector organisations can usually choose to outsource the catering contract to a private organisation or take control of the catering themselves. In some areas, especially schools and prisons, there is a small but growing trend towards bringing the catering service back in-house.

#### **Case study: St Aidan's school, Harrogate**

**Unhappy with the quality of the food provided by their contractors, St Aidan's took the service in-house and appointed an experienced chef/catering manager who had previously worked in the restaurant trade. The new manager instigated rigorous checks on deliveries and replaced all but one supplier with many locally based suppliers. The school invested in staff training in many aspects of catering, from using fresh ingredients to better storage techniques. As a result, the school estimates that they have achieved ten per cent cost reductions and increased ingredient quality.**

The problem with outsourcing the catering contract is that the institution in question is unaware of routine, volume-based discounts and rebates that the caterers may be receiving but not passing on. The National Audit Office estimates that the largest UK catering firms may be earning up to £95 million in discounts and rebates from suppliers, which is not passed on to their public sector clients.

In the long term it is cheaper to buy in raw ingredients and pay someone to cook them than leave the whole service to an outside organisation. There are other benefits. An Ofsted report, published in 2007, found that food which was cooked on the school site tended to be 'well presented and appetising'. Food prepared off-site 'tended to look unattractive and, in several cases, was cold by the time the pupils ate it'. What's more, local authorities who provide an in-house service have been found to be more likely to produce menus mostly or fully aligned with regional seasonal production.

### **Barrier: poor staff skills**

Efficient and effective food procurement in the public sector calls for appropriate skill and training, but, according to professor Kevin Morgan, 'sustainable public procurement is further compromised by a lack of

#### **Case study: St Andrews Healthcare Northampton**

**St Andrews aims to be a national leader in providing sustainable food for service users and staff. It started by reducing the number of suppliers by a third and deliveries by a quarter, saving, they estimated, 96,000 food miles. They now have 11 on-site production kitchens and a central food store that allows bulk purchase of local and organic food.**

skills, which means that procurement managers have neither the competence nor the confidence to play a catalytic role in greening the realm.' This is indeed the finding of a number of reports, including those produced by Deloitte and the NAO which found that few caterers used consultants to help them reduce costs and staff lacked basic skills, such as checking stock and deliveries, food storage and book keeping.

contracts to local suppliers. By stimulating interest in the provenance of food, individual health and wellbeing is enhanced. Fresh, local, raw ingredients require little packaging and seasonal products are usually cheaper.

The problem, for the shortsighted, is that many of these benefits are not immediately obvious. The urgent need to re-localise the food supply chain is severely hindered by the current absence of a formal, comprehensive food policy. Instead, isolated success cases are entirely due to the will and enthusiasm of individuals. Italy has shown that there is a legal, workable model that can challenge industrial farming methods and global food transport systems. The EU directives are a gift, but without the skills and know-how to do things better procurers will keep on doing what they've always done, getting the same results.

*Maria Cross is co-author of Nutrition in Institutions (Wiley-Blackwell, 2009)*

### **Solution: Provide procurers with the skills they need**

Although the PSPFI produces written guides there is little evidence that they are either used, or useful. On-line toolkits are cheap to produce but cannot replace real, hands-on training. Mindful of this obstacle to sustainable procurement, the Soil Association offers training to public sector buyers to explain the processes for sourcing local, seasonal and organic food and to help to identify the producers/suppliers to buy it from.

The Soil Association also runs a Food for Life programme, which operates an accreditation scheme, or Catering Mark, which offers a step-by-step route to sustainable catering for both the public and private sectors. There are three standards: bronze, silver and gold. To attain gold status, the caterer's menu must be 75 per cent freshly prepared, 50 per cent local and 30 per cent organic.

### **All together now**

The benefits of promoting local economies are well known. Supporting local food producers enhances rural development and regenerate communities. According to the New Economics Foundation, local authorities could increase the amount of money circulating in their area by almost 400 per cent by issuing

#### **How to be a successful public sector food procurer or provider of quality, fresh local and sustainable produce without breaking the bank or the law.**

- 1. Become efficient. Employ consultants and join the Soil Association's Food for Life programme.**
- 2. Get together with other public sector food buyers in your area to strengthen your negotiating power. The Soil Association can help you do this. If you are a food supplier, form or join a cooperative.**
- 3. Develop a creative approach to EU trade regulations, which are nowhere near as prohibitive as they appear. Read more about how Italy manages to do this in The School Food Revolution by Kevin Morgan and Roberta Sonnino.**
- 4. Get back to basics, and take the catering service back in-house.**



# Mobile phones and health

Later this year, an Irish mobile network will launch 'Firefly' - the mobile phone for kids. With even Government advice against such a move, **Yanar Alkayat** looks at what we know for certain about mobile phones

'I am seeing more patients than I would expect in their twenties and thirties with a diagnosis of brain cancer,' says Australian neurosurgeon Dr. Vini Khurana, who is concerned that a relatively rare but life-threatening disease is on the rise.

The disease causes seizures, blindness and cripples coordination, and involves a build-up of abnormal cells in the brain. It can take between 10 and 20 years to develop and diagnose. While the risk factors are yet to be confirmed, a growing body of evidence is linking mobile usage with certain tumours.

Khurana hit the headlines earlier this year with the publication of a study that concluded mobile phones could be just as harmful, if not more so, than asbestos or smoking. He reviewed over 100 papers from brain

specialist Dr. Lennart Hardell, a leading oncologist and researcher from Sweden's Orebro University Hospital, and a multinational study into mobile phones and brain tumours, known as the Interphone project.

**'A decade of investigation has consistently shown that using a mobile for one hour a day over ten years could increase your chance of brain cancer by 100 per cent'**

Hardell is renowned in the field of brain cancer research, and while some critics claim his epidemiological evidence is insufficient to establish a link between mobile phones and health effects, his decade of investigation has

consistently arrived at the same conclusion: that a ten-year usage of mobile phones, for one hour every working day, could increase your chance of getting a brain cancer by at least 100 per cent.

Having examined Hardell's work, Khurana is inclined to agree with him. But he believes that only 'an inexplicable increase in rates of brain cancers and other neuro-behavioural disorders,' would nudge governments into

meaningful actions and protective measures.

So what are governments doing currently? In the UK, the Government has been involved in a huge 13-country study since 1999, to discover if exposure to low-level radio frequency (RF) radiation exposures could affect brain tumours (acoustic neuroma, glioma, meningioma and tumours of the parotid gland). The task has been mammoth, drawing on hundreds of studies on over 14,000 people and costing a whopping \$30m but the world is still waiting for results.

The study was set to be released in 2005, but has been stalled due to controversy and confusion, and is now scheduled to appear

'mandatory prescriptions for safety', nor are they 'the last word on the issue', or 'defensive walls for industry or others.'

ICNIRP limits are set to protect against a small number of known and 'established' effects of using mobile phones, but do not take into consideration any 'non-established effects'. So when it comes to protecting the public from say, an increase in cancer risk, the guidelines simply say: 'available data are insufficient'.

Whatever the effects are eventually proven to be, it is highly likely that, like many other biological processes, children's reaction will be more pronounced than in adults. Although

'We have to be sceptical all the time as it is part of the scientific process,' says the agency's Science Spokesperson, Michael Clark. 'We realise this can be irritating for people who believe there is an effect but evidence has to be hard and clear.'

What constitutes 'hard', 'clear' or 'sufficient evidence' has been central to the war of words brewing over the past decade. Clark agrees that there is not yet enough evidence for further action but enough evidence to implement some level of precaution.

### What is being done?

Diverse organisations across the world are expressing concerns over the potential risk to children and adults of wireless technology. According to The International Commission for Electromagnetic Safety, 'epidemiological evidence is stronger than before to conclude there is risk,' calling for standards to be more precautionary.

Earlier this year, on April 2nd, the European Parliament adopted a report on health concerns associated with electromagnetic fields. MEPs voted 559 to 22 for more reliable information to be made available and called for tighter safety standards and more funding into research for long-term exposure risks.

The Bio-Initiative Report is a key study that has sparked and supported many of these concerns. A large pool of international scientists, researchers and public health policy professionals came together to study over 2000 peer-reviewed publications on the effects of electromagnetic fields and health.

Recommendations from the report have led some governments such as German neighbour, Liechtenstein, to carry out their own studies and pledge to lower safe exposure limits to almost one tenth of the ICNIRP levels

## 'If adults are affected by mobile phone radiation it's possible that children might be affected much more because they react more severely to external factors'

later this year. There is division amongst the group's researchers over how to interpret the data, as well as heated debate over the accuracy of results. Charges of 'recall bias' (the faults associated with asking participants about past behaviour and relying solely on their recollection) are bandied about, though these could arguably lead to both over and under-estimation of the impacts.

### The safety precautions

The limits on RF radiation to which most countries adhere are set to ensure an electronic device does not heat up body tissue by more than one degree, classified as a 'thermal effect', during six minutes of use. What scientists, doctors and experts fear is that biological effects are occurring at levels below the guidelines, which could possibly lead to adverse health effects in the long-run.

The UK's Health Protection Agency (HPA), which advises on government policy, and the Mobile Phone Operators Association (MOA) that represents the mobile phone companies, feel the guidelines set by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), are sufficient for protecting public safety.

'ICNIRP has stated quite clearly that in developing guidelines it undertakes "a critical, in-depth evaluation of the established scientific literature using internationally accepted quality criteria"' says Mike Dolan, Executive Director of MOA. 'ICNIRP keeps its guidelines under regular review and reporting of experimental biological effects does not imply that such effects cause disease - walking up stairs will produce a biologic effect but no harm results.'

But this doesn't seem to tally with recent remarks by the Chairman of the setting standards agency ICNIRP, Paolo Vecchia. At a conference in September 2008, he pointed out that his organisation's guidelines are not

the HPA believes there is no clear scientific evidence yet that public health is adversely affected by mobile use, it already advises caution, particularly for children.

'If adults are affected by mobile phone radiation it's possible that children might be affected much more because we know they react more severely to other external factors such as lead pollutants, radiation or UV light,' says Dr. Lawrie Challis, an emeritus professor of physics and ex-chairman of the government's mobile phones and health research programme.

Whether this is due to their still developing immune systems or not, Challis says, he would need 'a lot of persuasion that a child really needs a phone, especially under age of eleven.' His comments come just months before Firefly, 'the mobile phone for mobile kids' is set to launch in Ireland on a major network later this year, targeted at four to 12 year-olds.

Worryingly, the teen and pre-teen market has experienced a phenomenal rise in mobile phone usage. A recent report in The Times claims that half of five to nine year olds now own a handset.

The Department of Health warns that under-16s should use their mobile phones 'for essential purposes only' and to 'keep all calls short' but this is a single line in a mostly unread leaflet (Mobile Phones and Health leaflet, written by UK's Chief Medical Officers). Compared to the resources dedicated to tackling teen smoking or sexually transmitted infections, the emphasis on avoiding mobile phone use is minimal.

Is the government doing enough to communicate this precautionary message? 'Possibly not,' says Challis. Charities like Wired Child in the UK are trying to bridge this gap.

The government advisory body the HPA says it will highlight the message further when there is 'definite, clear, and scientific consensus' on the issue.



Firefly, the mobile phone for kids. On sale soon.

### Strength of microwave technologies

|  |               |
|--|---------------|
| Mobile phone held next to head:        | 10 - 150 V/m  |
| DECT cordless phone held next to head: | 10 - 80 V/m   |
| Microwave oven at 1m :                 | 1 - 6 V/m     |
| Wi-Fi laptop on lap:                   | 1 - 5 V/m     |
| Wi-Fi router at 0.5m:                  | 1 - 2 V/m     |
| Mobile phone mast at 150m:             | 0.5 - 2 V/m   |
| DECT base unit at 0.5m:                | 0.5 - 2 V/m   |
| Digital baby monitor 1m from baby      | 0.3 - 2 V/m   |
| Bluetooth device at 50cm:              | 0.3 - 0.7 V/m |
| DECT base unit at 3m:                  | 0.2 - 0.4 V/m |
| Wi-Fi router at 5m:                    | 0.1 - 0.2 V/m |

*Source: PowerWatch/Ecologist 2008*

### Useful links

- [www.brain-aneurysm.com](http://www.brain-aneurysm.com)
- [www.hpa.org.uk](http://www.hpa.org.uk)
- [www.icems.eu](http://www.icems.eu)
- [www.mobilemastinfo.com](http://www.mobilemastinfo.com)
- [www.powerwatch.org.uk](http://www.powerwatch.org.uk)
- [www.voicetheunion.org.uk](http://www.voicetheunion.org.uk)
- [www.wiredchild.org](http://www.wiredchild.org)

### Five things to do to reduce your exposure to RF radiation:

**1. Replace your cordless landline phone with a corded version to avoid the constant radiation emitted from its base. If you can't let go of the convenience, try Orchid phone - a low radiation cordless phone that is only active when in use.**

**2. Bluetooth and hands-free kits still transmit a radiation, although not as powerful, and definitely recommended on longer calls. For optimum safety try an air-tube headset, which operates on an acoustic exchange principle, so that only sound is transmitted to your body (so far only available in the US).**

**3. Limit calls to essential use, turn phone off when not needed, avoid sleeping with your handset by your head and hold the phone away from the head immediately after dialling as the phone uses maximum power until the call is connected.**

**4. Swap wireless internet routers with dLan plugs that uses cable wiring system and switch wireless router off when not in use.**

**5. When carrying a mobile phone avoid placing it in front trouser or breast pocket to minimise exposure to sensitive internal organs and avoid using a laptop on the lap as the transmitter, which is constantly communicating with the router, may be in the base and in contact with the body.**

by 2013, to 6Volts per metre (V/m), as opposed to ICNIRP's 61 V/m. Belgium has already reduced its exposure limits to 3 volts per metre (V/m).

The French Secretary of State for Ecology plans to run a pilot study in certain towns to reduce mobile phone mast emissions to 0.6V/m and several Parisian libraries have suspended wireless connections in line with Bio-Initiative findings. And when the Versailles Court of Appeal ordered one of its largest telecommunications operators, Bouygues Telecom, to dismantle its mast in a town in Lyons on grounds of uncertainty to public health, 135 lawsuits around the country followed against mobile phone companies, triggering a 'ministerial crisis' in France.

Here, the UK Government has pumped £3.1 million into investigating any links between mobile phones usage and long-term health effects such as brain cancers, Alzheimer's, Parkinson's and other neurodegenerative diseases, through a cohort study. This will involve tracking 200,000 mobile phone users, 90,000 of which will be in the UK, over 20 - 30 years and capturing any adverse effects.

Waiting that long for results however, could

evidence to say the possibility of risk cannot be ruled out. Action will inevitably be slow, as was the case with asbestos or smoking: wireless technologies are highly lucrative and are deeply ingrained within our lives.

In addition, government recommendations come from a limited pool of electromagnetic field scientists who belong to self-appointed committees, such as Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) that advises the European Parliament and the Advisory Board for Non-Ionising Radiation (AGNIR), which in turn advises the HPA.

This sharing of members can result in an imbalance of viewpoints, an issue recently raised in the European Parliament by MEP, Christel Schaldemose, which could mean that certain avenues are left unexplored.

'ICNIRP has been criticised both by researchers and organisations for setting limits too high to the advantage of the telecommunications industry and military sector. Does the commission consider SCENIHR experts as impartial and independent?' he said.

Opponents worry however that while the

## 'Opponents worry that while debate over impartiality and weight of evidence rumbles on, the public have welcomed wireless technology into their lives'

result in delayed action.

'We desperately need funding in the shorter term as the potential cost of a health epidemic in 20 years time is too great,' says Graham Philips spokesperson for Powerwatch. 'Money should urgently be invested into replications of existing case-control, cellular and animal studies that can be published within the next three or four years.'

### The future

Things are changing. Five years ago, health protection agencies would have denied any notion of risk but there is now enough

debate over impartiality and 'weight of evidence' rumbles on, the general public has welcomed wireless technology into the most private and intimate areas of their lives, without even being aware that any suspicion over safety exists. We are, in effect, unwitting subjects in an experiment many do not even realise is occurring. Many may never know.

*Yanar Alkayat is a freelance journalist specialising in health issues.*

# The first evacuation...

Earlier this year, **Dan Box** documented the world's first climate change evacuation, of the Carteret islands in the South Pacific. Now he asks: if this is the first of many such evacuations, what have we learned?

Ruth Marcella was crippled at birth and it hurts to walk this far around her island. But she is determined and, swinging her twisted hip, leads me through the palm trees to the white beach and the blue South Pacific ocean.

As she shows off her tiny homeland, Han, one of the Carteret Islands in the far east of Papua New Guinea, Ruth keeps saying sorry quietly. I ask why.

'I am sorry for my island,' Ruth replies. 'I believe that one day this island will disappear, and we won't have this island. We will lose it.'

Behind us men are cutting down dead breadfruit trees for firewood. Once pawpaw, taro and banana grew here, but no more. The ocean, Ruth says, is rising. Trees that once stood in the forest are now 20 metres out among the waves. Many that remain are poisoned by salt water. The islanders are hungry, and afraid.

The Carterets, it has been decided, will be abandoned, in what is the world's first official evacuation of an entire people because of climate change. If global warming continues

as we expect, many more will soon suffer the same fate. But how do you move an entire people? No one knows. It has been left to these islanders to set a precedent for the world.

'Of course I would not like to leave my island,' Ruth's father, clan chief John Sailik says. 'But I might have to go by force. The island will be all eaten up and I will have no where else to live.'

The younger generation, Ruth included, are planning on the basis that they have to leave the islands, now. But how is this evacuation actually taking place? Well, slowly.

## Money and politics...

The decision to evacuate the islands was first made by the Bougainville regional government - the islands' official political body - in 2005. A committee was formed, and plans drawn up to relocate 40 families a year. Negotiations over land to house them have started, stalled and spluttered back to life. But

no one has actually been moved.

Partly, this is because the government is busy. It is a decade since Bougainville emerged from a dirty civil war that literally decimated the population. The government has to wrestle with disarming armed gangs, reconciling former enemies and finding some way of resurrecting the economy so they can at least buy drugs for the region's single hospital, where a line of mothers clutching limp, hot babies wait in silence.

Partly, also, it is because the government is poor, and partly because it is corrupt. Bougainville president James Tanis himself tells me millions of kina donated to fund the evacuation of the Carterets may have been defrauded. At the very least, he does not know where it is.

Finding land is the most common excuse given for the lack of progress. In Bougainville, land claims by one clan may be challenged by another, generation after generation. Those few colonial paper records that survive moulder in a government department that



One of the Carteret islanders with his children and belongings packed into a small RIB. Many are moving to an uncertain future.

photo: Dan Box

has neither phone nor fax.

'We know we cannot with our own resources and technical expertise do it ourselves,' says Raymond Masono, chairman of the evacuation committee. 'We will need help ... The industrial nations of Europe, America Australia, Japan, they have to take some responsibilities of what is happening out there in the atolls of Bougainville.'

### Self-starters

Faced with this, the islanders have decided to evacuate themselves and have set up an NGO, Tulele Peisa, to do it (the name means 'riding the waves on one's own').

Tulele Peisa has a paid staff of none and scrapes by on public appeals and prayers; the Catholic Church recently donated a few scraps of old mission land for the islanders to build new homes.

The Carterets' Council of Elders then decided who should be first to leave, choosing the fathers of five families, each of whom had young children, did not drink too heavily and could be trusted to work hard. In May, I watched these men arrive in a single outboard-engine boat at Tinputz on Bougainville's south island, where they began building homes in a jungle clearing before sending for their wives and children. Future boatloads will be landed on other plots of mission land, when money can be found to pay for boat-fuel and wood with which to build new houses.

### 'What happens when you want to move a state? What happens when the Maldives moves to India and says it wants to still be the Maldives?'

These five fathers are quietly anxious about their new lives. In the past, other people have left the Carterets and moved to live with families on the mainland. Many were met with hostility and eventually returned. Some of the women were raped. Through Bougainville's central mountains a private army – a remnant of the civil war - still marches under the rule of a self-declared king.

Tulele Peisa itself may have the best intentions, but is hobbled by a lack of power and money. The government has more of both, but so far has done little to reveal them. Worse, the two sides remain divided by petty politics and have failed to work together, causing even more delay.

This inaction is taking its toll on the people

both organisations claim to be working to help. Andreas Kaholo, chairman of the Council of Elders, tells me he wants to resign.

'Really it is difficult. I do very much feel responsible for the people,' he says.

### Is climate change to blame?

So how urgent a threat is it that is forcing the islanders leave their homes? The answer is bound up with another; once they leave, will the islanders become, as many reporters have described them, the world's first climate change refugees? Sceptics say it is natural for coral atolls to sink, and this isn't global warming at all. Ask President Tanis, whose government made the decision to evacuate these and four other island groups – around 8000 people in all – how he knows this is climate change and he replies:

'There is no independent scientist we have consulted. While the whole world is blaming the rising sea level on global warming, I don't think we need to consult anyone. If the world is believing that, we are part of the world.'

Travelling to the islands, you are forced to negotiate this, and other obstacles, thrown up often by those trying to help.

One basic question; are they 'refugees'? It is a phrase I too used, at first, but no, the Carterets people are not. Legally, a refugee is someone fleeing war or persecution in their own country, a definition that simply doesn't allow the islanders in.

So, if they are not refugees, what about the other part of the phrase; is this really climate change? Bluntly, we may never know. Either this is climate change, or the Carterets are sinking naturally, or it is both of these, or neither. Talking to islanders who remember the shore being thirty or forty metres further out to sea than where it is now, my money is on both. I'm no expert, but this seems a good bet; in the language of aid workers, climate change is a 'multiplier', it indirectly contributes to and compounds other causes for people to leave their homes. In this case, the coral atoll may be sinking naturally but if so, the intense high tides and storm surges that regularly rip away what land remains, and which the islanders say are now worse than any in living memory, are making this natural process worse.

This complexity – or confusion – makes the phrase 'climate change refugee' redundant. The International Organisation for Migration prefers the term 'environmentally-induced migrants', which suffers in comparison, because it sounds more boring. And yet, it shouldn't be, because the numbers involved are huge. How many people are we talking about? Estimates range from 25 to 50 million worldwide by the year 2010 to almost 700 million by 2050 The IOM leans toward a conservative 200 million by 2050 - equivalent to the combined populations of Britain,



### Where's next?

#### Tuvalu

|                               |                    |
|-------------------------------|--------------------|
| Location                      | 8 00 S, 178 00 E   |
| Land area                     | 26 km <sup>2</sup> |
| Coastline                     | 24 km              |
| Highest point above sea level | 5 m                |
| Population                    | 12,373             |

#### Marshall Islands

|                               |                       |
|-------------------------------|-----------------------|
| Location                      | 9 00 N, 168 00 E      |
| Land area                     | 181.3 km <sup>2</sup> |
| Coastline                     | 370.4 km              |
| Highest point above sea level | 10 m                  |
| Population                    | 64,522                |

#### Kiribati

|                               |                     |
|-------------------------------|---------------------|
| Location                      | 1 25 N, 173 00 E    |
| Land area                     | 811 km <sup>2</sup> |
| Coastline                     | 1,143 km            |
| Highest point above sea level | 81 m                |
| Population                    | 105,432             |

#### Micronesia

|                               |                     |
|-------------------------------|---------------------|
| Location                      | 6 55 N, 158 15 E    |
| Land area                     | 702 km <sup>2</sup> |
| Coastline                     | 6,112 km            |
| Highest point above sea level | 791 m               |
| Population                    | 107,434             |

#### The Cook Islands

|                               |                       |
|-------------------------------|-----------------------|
| Location                      | 21 14 S, 159 46 W     |
| Land area                     | 236.8 km <sup>2</sup> |
| Coastline                     | 120 km                |
| Highest point above sea level | 652 m                 |
| Location                      | 11,870                |

#### Tonga

|                               |                       |
|-------------------------------|-----------------------|
| Location                      | 20 00 S, 175 00 W     |
| Land area                     | 236.8 km <sup>2</sup> |
| Coastline                     | 419 km                |
| Highest point above sea level | 1,033 m               |
| Population                    | 120,898               |

#### Maldives

|                               |                     |
|-------------------------------|---------------------|
| Location                      | 3 15 N, 73 00 E     |
| Land area                     | 300 km <sup>2</sup> |
| Coastline                     | 644 km              |
| Highest point above sea level | 2.4 m               |
| Population                    | 396,334             |

#### Sundarbans delta

|                               |                       |
|-------------------------------|-----------------------|
| Location                      | 21 56 N, 88 51 E      |
| Land area                     | 4,143 km <sup>2</sup> |
| Coastline                     | (unknown)             |
| Highest point above sea level | 2.11 m                |
| Population                    | 4,000,000 +           |

## A TACTICAL RETREAT

France and Germany on the move.

One immediate worry is that, like those reporters who turned up to pronounce the islanders the world's first climate change refugees, both NGOs and the media have in the past chosen to throw only the wilder numbers and definitions around. The danger of doing so is that, by turning the issue into a sensation they may provoke a sensationalist response from governments, one that slams the door on those who need help. Speaking on environmental migration recently in the Hague, Yvo de Boer, executive secretary of the UN Framework Convention on Climate change, warned of a world 'split between those who do not sleep because they are hungry and those who do not sleep because they are afraid of those who are hungry.'

### The first of many

If the roughly 2500 people of the Carterets are to be joined by 200 million others also forced to flee their homes, it is likely that many of these evacuations, too, will be bedevilled by the same monsters of poverty, fraud, bureaucracy, land rights and hostility from local people. So it would seem worth learning the lessons of this evacuation, now. But aside from a constant stream of reporters – including myself – few people it seems are taking an interest.

'The worst part is this should be easy,' says one senior aid worker in Bougainville, who did not want to be named. 'This is just a bunch of people on an island moving a few hours by boat. What happens when you want to move a state? What happens when the Maldives moves to India and says it wants to still be the

Maldives?'

A lawyer involved in the same conversation looks blank.

'It can't be done,' she says.

Slowly, governments are starting to look for answers to these questions. In Search of Shelter, a UN-sponsored report published in June, says: 'Policy decisions made today will determine whether migration becomes a matter of choice amongst a range of adaption options, or merely a matter of survival due to a collective failure by the international community to provide better alternatives.'

But, to stress it again, the international community is moving slowly. Seeing the damage caused to the Carteret Islands by the last storm season over Christmas, measured in fruit-trees destroyed and areas of productive land turned to salty, mosquito-rearing swamp, I wonder how much time they have to wait. A year maybe? A few more?

And yet, living on the islands, I am amazed by the lack of urgency. Children play happily. There is a weekly football tournament, most of the players barefoot, a few with a boot on only their kicking foot. Slowly, I realise these people simply cannot afford to panic, they have neither the money nor social infrastructure to respond to whatever threat the ocean poses. The islands' seat of government is just that – a plastic seat, behind a bare wooden desk with a school exercise book for paper.

Instead they wait, living on fish, rice and coconuts. Sometimes a rusty old ship brings food aid from the mainland. I am continually asked when the next shipload will arrive. Yet these are the kindest people I have ever met. Every day someone among the islanders - different people on different days - gives me

fish, freshly caught, to eat. Despite this, I lose a lot of weight.

*Dan Box travelled to the Carteret Islands with funding from the Royal Geographical Society Journey of a Lifetime award.*

### Let us suffer this alone...

The Carteret Islanders have seen little in the way of international help, but they have seen plenty of reporters – 16 separate visits at the last count, including mine. None of this attention has been of any direct benefit to the islanders themselves, though they have often been expected to provide free food and accommodation to reporters, despite being well aware that many plan to profit from the subsequent sale of their films, photographs or articles. As a result, a \$5000 'administration fee' has been announced, that must be paid by anyone hoping to visit the islands. In my case, this fee was waived.

The following is from a letter by the islands' Council of Elders:

**Advisory to journalists, flim maker, photographers, writers, researchers and tourists...**

**Thank you for your interest in the Carterets Atoll. We regret to inform you that the atoll community is currently unable to accept any visitor to any of the islands...**

**Should you wish to be considered to come to the atolls an amount of US\$5000 as administration fee has been agreed upon by the Council of Elders and the Tulele Peisa and must be paid prior to coming to the island.**

**Last but not least, we would like to express our heartfelt thanks and appreciation of your concern and interest. Once the situation is more settled and our future as well as livelihoods is more secured, we hope to be able to lift the ban and welcome visitors to our islands again.**

**God bless you!**



The Carterets atoll as seen from space.

photo: NASA



## **Pig Business: behind the film they tried to ban Tracy Worcester's 'Pig Business' – a groundbreaking exposé of US industrial pig farming conglomerate Smithfield Foods – has met with repeated attempts at censorship by the company's lawyers to keep it off our screens and minds...**

After a showing of my film, *Pig Business*, at the Royal Society of Arts on 13th November 2008, Channel 4, which was scheduled to broadcast the film in the New Year, received two letters from lawyers acting for the main focus in the film, Smithfield Foods of America, the world's biggest pig producer and processor.

Fearing the legal might of a \$12 billion company threatening to sue, Channel 4 pulled my film just before broadcast on February 3rd 2009.

To prepare for the worst, Channel 4 made changes to accord with England's business-friendly libel laws and the UK TV's fairness standards, administered by OFCOM. Despite a further two threatening letters, Channel 4 ran the film on its More 4 channel on June 30th.

### **Free speech?**

In the US, the Constitution's First Amendment enshrines free speech as a right. So, if you allege in good faith that a public company is causing harm, as long as the allegations are not made maliciously, the company has to prove that it has not caused the harm.

In England however, the burden of proof is reversed. The person making the allegation has to prove their case with scientific analyses, court judgments or credible witnesses. So, if a Polish worker says that his doctor told him his lungs are damaged because of the gases inhaled during intensive working conditions in one of Smithfield's factory farms, I have to prove that the worker is telling the truth. Not always an easy job. Particularly if that doctor now works for Smithfield testing the health of potential employees and it is not possible for outsiders to acquire the worker's medical records. And proving the causal connection between the gases, like hydrogen sulphide and ammonia,

and this particular worker's illness is not cheap.

The reason why the American courts accept that allegations like this can be published is because there is plenty of evidence from peer-reviewed reports, court transcripts and newspaper articles all making the point that workers in these intensive factories become sick by inhaling vapours from degrading animal faeces.

But in England, the evidential bar is much higher. The High Court requires the judgment of a Polish court or I have to find at least 5 other workers who dare break their silencing contract with one of the wealthiest companies in Poland, to back up the 2 workers describing worker their work related illnesses.

### **A first class ticket to libel land...**

Though America's libel laws respect freedom of speech for people and the press, there is always the threat of libel tourism – where the lawsuit against the film would be brought to the UK to enjoy our corporate-friendly libel laws.

The letters sent by Smithfield's legal team have succeeded in scaring the insurance companies away from insuring the film unless I pay the first \$500,000 excess or lobotomise the film. Without the insurance, not even NGOs will screen the film.

Not even the tabloids are immune from Smithfield's threatening letters: both *The Daily Mail* and *The Evening Standard* have received warning letters for reporting about the film. So did the Polish TV station *Szczecin TV* in 2006, and the Polish National Geographic magazine. The latter was requested - unsuccessfully - to apologise for an article that reported on water and air pollution near a hog farm or face legal action.

On the day of a showing at the Barbican arts centre in London on 27 May 2009, Smithfield's lawyers told the Barbican's management that the film was 'defamatory'. As a result, the audience was made to wait half an hour while the executive producer and myself were told that the showing would only go ahead if we signed a document agreeing to indemnify the Barbican.

Putting it on my website would apparently expose me to Smithfield's litigation in every jurisdiction. So the message will have to be spread guerilla-style - i.e. below Smithfield's radar.

The film is no longer available on Channel 4's website, but it is available free of charge to anyone who wishes to give a private screening.

There is only one way for you to make up your own mind on whether this film is defamatory or fair and balanced reporting – you'll have to watch it.

*Tracy Worcester is an environmental campaigner. Visit the Pig Business website: [www.pigbusiness.co.uk](http://www.pigbusiness.co.uk).*



Fearing the impact of images such as this on its business, Smithfield Foods has fought a fierce legal battle.