

Transforming knowledge

Making light of physics

Take one scientist, one artist, and a thorny health issue. Place under a pylon and stand well back.



RICHARD BOX

Above: FIELD, the art installation by Richard Box.
Right: Professor Denis Henshaw of the Department of Physics (left) with Richard Box.

When you're putting forward a scientific argument that concerns the health of thousands of people in the UK, it's good to have illustrations. Charts and statistics are one option; better still, though a good deal rarer, is to have your argument transformed into a striking work of art that ends up featured in full colour on the front pages of the nation's newspapers. This is exactly what happened in February 2004.

The scientist is Professor Denis Henshaw in the Department of Physics, who is centrally involved in worldwide studies of the health effects of living close to the electric and magnetic fields from overhead powerlines and has frequently challenged the government and the power companies over their safety limits. The artist is Richard Box, whose 2002/03 stint as the Department's artist in residence resulted in 'FIELD', a stunning art installation on a hillside near Bath in February 2004 – and a disturbing illustration of Professor Henshaw's arguments.

The phrase 'electromagnetic field', when applied to powerlines, actually refers to two separate phenomena: electric fields, caused by the voltage on the line and measured in volts per metre, and magnetic fields, caused by current flowing in the line and measured in teslas. Both are implicated in the evidence for health risks, and this has sometimes served to muddy the waters and confuse public debate. The electric field is responsible for corona ions, a particular subject of research in Professor Henshaw's team. These are electrically charged particles produced by the ionisation of the air near the powerline cables. The ions attach themselves to particles of air pollution and can be carried several hundred metres by the wind. When inhaled, they are particularly likely to be trapped in the lung.

The idea that living beneath powerlines can cause ill health is not new. 'There have been adverse health effects reported since 1979,' says Professor Henshaw. It was only in 2001 that an international group brought together studies from all over the world and produced clear evidence of a doubling of the incidence of childhood leukaemia in areas where the magnetic field is stronger than 0.4 microteslas – well below the field strength under pylons. But in the UK these results were not publicised; instead, the British contribution to the pooled study – known as the United Kingdom Childhood Cancer Study – published its own findings separately later in the same year. 'In isolation, the UK figures were much less conclusive,' says Professor Henshaw. 'It was like a jigsaw puzzle – only when you put them all together could you see the picture, which showed a clear doubling of risk.' The full extent of adverse health effects, he believes, is still being obscured.

Meanwhile Richard Box, an artist at Bristol's Spike Island, had been making pictures of his own. 'Someone had told me there was enough power under those lines to light a bulb,' says Richard. 'So I took some bulbs along to a hill in Wales and tried it.' And it worked. Intrigued, he experimented further – with sometimes alarming results. 'I was getting two-millimetre arcs between my fingers and the tubes,' he says. 'At moments like that, I'd start thinking, "Okay, I should go home now".'



TAMANY BAKER



‘When those pictures appeared, I said that if it can do that to 1,300 tubes, what can it do to you?’

Professor Denis Henshaw

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Richard Box

Richard asked a fellow artist who specialised in glass-blowing to bend a long neon tube into the shape of a human brain. He took the result back to the hillside, placed it under the pylons and took a series of photographs. Then he took the pictures to Professor Henshaw.

‘I was very impressed,’ says Professor Henshaw. ‘They illustrated graphically that powerlines do indeed have these electrical fields around them. Even when the bulbs are on the way out, and start flashing or flickering in their sockets, they still light up under the powerlines.’

In 2002, Richard received a Leverhulme Grant to become the Department’s Artist in Residence and began learning the techniques of glass-blowing in the Glass Workshop. He also collected old fluorescent tubes from offices, factories and hospitals, and worked on the idea that would become FIELD, some two years later.

It was a sight that few newspapers could resist: a forest of 1,300 fluorescent tubes standing on their ends beneath a pylon, lit up by the waste emissions from the powerlines and made visible as night fell. Richard had expected little more than a couple of paragraphs in the *Western Daily Press*, but he woke on 21 February to a surprise: FIELD was featured in full colour on the front pages of *The Guardian* and *The Independent*, and media interest continued for a fortnight, with articles in the *Daily Mail*, the *Mail on Sunday*, *Times Higher Education Supplement* and the *Western Daily Press*, and TV coverage on *Sky News*, *What the Papers Say*, *Tonight with Trevor MacDonald*, *Richard and Judy*, ITV West and BBC *Points West*.

‘When those pictures appeared, I said that if it can do that to 1,300 tubes, what can it do to you?’ says Professor Henshaw. ‘I got into enormous trouble from some quarters for saying that.’ But in March 2004, the National Radiological Protection Board (NRPB) finally admitted that the risk of childhood leukaemia appears to double under long-term exposure to magnetic fields of 0.4 microteslas. At the same time, the NRPB announced a reduction of the safety limit from 1,600 to 100 microteslas.

Professor Henshaw spent most of 2003/04 preparing for his task as Chair of the CHILDREN with LEUKAEMIA Conference in Westminster. The five-day event, which took place in September 2004, was a huge success, drawing together academics from every continent and many different disciplines to build a comprehensive list of possible factors at work in the significant rise in childhood leukaemia last century. Powerlines, needless to say, were prominent on the agenda.

Richard Box has been busy too: FIELD won the 2004 Bombay Sapphire Prize, the world’s biggest annual glass design award, and he continues to attract interest from magazines and other media. ‘I also get calls from members of the public who think I’m the professor who did all the research and have all these questions about power lines,’ he says. ‘I have to put them right and pass them on to Denis.’ □