

# How To Handle Power Lines

## **All power corrupts - Lord Acton.**

Having briefly proposed some of the biological mechanisms at work whereby electropollution affects us, on this page I turn to the practical aspects of what we can do to protect ourselves in case the hazards pointed at by epidemiology and laboratory studies turn out to be real.

This page looks at power lines, by which I mean not only the wires strung out across the country which transmit electricity from power generating plants to the end user, but also the distribution lines, down to 11,000 volts, before they are transformed down again to the voltages (415 and 240) which we use in our homes.

All these are known as power frequency lines, and they alternate at a frequency of fifty cycles per second (50 Hertz, abbreviated to Hz). In America and some other countries they alternate at 60 Hertz, which is slightly further away from the frequency at which our brains themselves oscillate all the time we are alive.

If scientists had realised early enough how harmful non-ionising electromagnetic energy fields, even at very weak strengths, can be to people who live near them, the electricity generating utilities might have re-thought the design of the National Grid, and like some Scandinavian countries, elected to place their generating stations close to the cities and industries which consume their power. However, fear of the effects of nuclear emission, cost considerations (urban and suburban land is expensive), as well as the distance from sources of fuels like coal, or coolants like water, have dictated that the power stations, at least the nuclear ones, are built on remote coasts like Dounreay in Caithness and Sellafield in Cumbria.

This means that there are more high voltage lines, and that the heat which might have been efficiently used for heating the community's homes is daily sent up into the heavens from massive unsightly cooling towers. I gather that some 65 percent of a power station's heat is lost in this way.

Let us hope that new power stations at any rate will be established in proximity to the industries and the populations they serve, and adequately protected by Faradic shielding.

Too late now! We must make the best of a bad job.

It is estimated that over 80,000 UK citizens and more than a quarter million Americans live close to high voltage power lines. Michel Coleman and his colleague Valerie Beral, one of Britain's top epidemiologists working at the London School of Hygiene and Tropical Medicine, said in a review of scientific papers on this subject (Beral & Coleman, 1988) that it might be as much as one percent of the UK population, which is about half a million people.

My advice to them all is, move house! This is not so drastic a remedy as all that, because people on average move home every seven years anyway these days, as a result of changing job, getting married, divorced, retirement and so on, - a measure of the mobility of our modern society.

In Vancouver recently, as if to underline my advice, the British Columbia BC Hydro utility in 1989 announced that it was prepared, upon request, to pay a fair market price to landowners concerned about electromagnetic emissions from its new 230kV line. The 90 mile Dunsmuir-Gold River power line was built on an existing right of way which already had two 138 kV power lines, but the new line, which serves a pulp and paper mill, according to Louis Slesin's Microwave News, came on stream in July 1989.

When the company sent letters to those whose property was within 50 metres of the edge of the existing right of way (125 metres, making a total eligible distance of 175), the utility received acceptances from 153 owners, which is 90 percent. of those approached. Only six people decided to stay. Those contemplating an investment in PowerGen should bear that in mind! Compensation of say £50,000 to each of the 80,000 members of this inescapable powerline residents club of Great Britain would cost £4,000 million, - still only about three years of the National Grid's disgustingly excessive profits.

It may one day become illegal eventually for developers to build new houses near existing power lines anyway, in which case your house or flat might suffer a dramatic fall in value, so get out while the going is good! Ideally I'd like to see a Certificate of Electromagnetic Field Safety issued for every house put up for sale. Estate agents take note!

There is a good deal of evidence to support your house move. It really began in 1974 when Nancy Wertheimer, a housewife from Denver, Colorado, began to think of resuming her career as an epidemiologist. Her marriage had ended, the children were grown up, and she had some time at last to make a contribution to society again, based on her former college training.

She began by trying to see if she could unearth any environmental factor behind childhood leukemia, a tragic condition which unaccountably causes the death of many hundreds of U.K. children each year.

Paul Brodeur worked as a columnist for the authoritative New Yorker magazine (which also pioneered Rachel Carson's classic work on chemical pollution *Silent Spring* in the 1960s). His forthright book *The Zapping of America* (1977) was one of the earliest and best accounts of electropollution. In a new series of New Yorker articles, he described Nancy Wertheimer's moment of insight:

"It was on my third or fourth trip", she told him, "I had stopped at one of the birth addresses - an old frame house on the edge of the warehouse district in downtown Denver - and I walked into an alley behind it, which ran between the back yards of two rows of similar houses.

"It was a mixed neighbourhood - black, white, and Mexican - and many of the houses were run down. Like most of the back-yard alleys in the Denver area, this one was paved, so that trucks could get through it pick up garbage and trash, and it contained a number of poles strung with electrical wires and telephone lines. When I looked up I noticed an electrical transformer on a power pole behind the house I had stopped to examine. The transformer was black and cylindrical, and it was attached to the pole above a crossbar that supported several electrical wire, and when I saw it I said to myself, Hey, haven't I been seeing a lot of these things lately?"

As she went round the houses where the victims had lived it gradually dawned that many were in close proximity to where the primary and secondary wiring configurations transformed voltages of 7,600 volts down to 240 volts for domestic consumption. As in the U.K. such transformers are often attached to poles, and these poles can also carry telephone lines and other cables.

Only when she read a news article suggesting that power lines might be a danger to health (possibly based on Dr. Louise Young's book *'Power over People'* (1973), or *Pollution by Electrical Transmission* which came out the following year) did she begin in earnest to investigate their connection with childhood leukemia.

She asked for technical assistance from a physicist, Ed Leeper, who explained the rudiments of electromagnetism and designed a field measuring meter for her. Together, at their own cost, the team documented a total of 344 cases, which by comparison with children not suffering from cancer (control cases) was twice as many as might have been expected to live near the wiring configurations. The results were not finally published until 1979, when they appeared, after scrutiny by other scientists, in one of the country's most authoritative scientific journals (Wertheimer & Leeper, 1979).

In their paper Wertheimer and Leeper said:

"At these points the voltage has been stepped down and 'transformed' into current...it was particularly close to those transforming points that were overrepresented among our cancer cases".

They went on to say (after conceding that magnetic fields are usually cancelled in normal wiring, where the return current tends to balance the supply current) that "such cancellation is imperfect in the vicinity of

many dwellings because the wires are often separated in space, and more importantly because some of the return current does not flow through the wire at all, but returns instead through the plumbing system to which most electrical systems are grounded at each house".

Whereas the fields from a domestic appliance are intermittent (we don't use the vacuum cleaner all day, or continually boil a kettle) and fall off rapidly with distance, the electric fields from a high voltage power line are continual and all pervasive. Perhaps unfortunately, Nancy did not fully appreciate that it was the electric component rather than the magnetic which has the permanent presence: the magnetic component varies with load, but the electric field is dependent on voltage.

Only 20 years later were fresh epidemiological studies (preluded by one I did myself) to demonstrate a clear dose-response relationship with the electric field, thereby solving what became known as the wire-code paradox. This paradox arose when measured field studies were unable to find any clear association between the magnetic component of the electromagnetic fields. In July 1996 however, only a month after my study had appeared in print (Coghill, Steward et al., 1996), Anthony Miller, Teresa To, from Toronto University and colleagues David Agnew and Lis Green from Ontario Hydro reported their re-analysis of a cohort of 31543 male adult workers (of whom 1484 were cancer cases) who had worked at the Ontario Hydro plants actively since 1973. This database had been originally the major part of a tri-utility study involving workers from two other utilities, Hydro Quebec and the French EDF, whose exposre characteristics were quite different and probably lower.

I never really got round to reading the detail of the new Toronto study for nine months, being too involved with some cellular work investigating how ELF electric fields were disturbing respiratory enzymes. It was quite astonishing to me to see that the Miller results were almost identical to ours, since neither they knew about our study, nor we about theirs, and both were published within a few weeks of each other in quite separate peer-reviewed journals, one in Europe and the other in America.

In Miller's study the exposure was determined by taking measurements for five days with Positrons strapped to each worker's waist. This therefore ignored the possibility (unless they wore the Positrons all night, ouch!), that there was also an element of domestic exposure involved. Even so, Miller's findings were that "Odds ratios were elevated for haemopoietic malignancies with cumulative electric field exposure. After adjustment the odds ratio for leukemia in the upper tertile was 4.45 (95% confidence interval 1.01-19.7)". The group found that there was a clear dose-response relationship with electric field exposure, or with combined electric and magnetic, but not with magnetic alone.

Nevertheless it did matter a little if both electric and magnetic fields were high: Odds Ratio CI 95%

Electric high, magnetic low: 4.27 1.00-18.17

Electric high, magnetic medium 4.79 1.03-22.22

Electric high, magnetic high 5.53 0.88-34.63

Of those cancer sites which were of a priori interest only malignant and benign brain tumours failed to show elevated odds ratios. Even lung cancer, traditionally associated with smoking, showed an elevated ratio.

Our study, on a much smaller sample of 56 cases and measured residences rather than workplaces, found that above 20V/m the relative risk was 4.69 (95% confidence interval 1.17-27.78). When one converts Anthony Miller's metric of cumulative V/m per annum into an average field strength, assuming a 20 year occupation period since 69 percent of the cases had worked for the utility for over 20 years, figure for start of the highest tertile seems to be 19.1V/m, a remarkably close similarity to our 20V/m.

Leukaemia often occurs in inexplicable clusters. An English example of clustering can be found in the density of transmission lines emerging from power generating plants.

Both at Dounreay and at Sellafield, (the last of which embraces the original Calder Hall, the first Magnox nuclear generating plant, opened by the Queen in 1960, unusually large clusters of childhood leukemias have been noted. One group of families went so far as to sue British Nuclear Fuels Plc (unsuccessfully) on the basis that their radioactive emissions from the re-processing plant were responsible for some at least of the 32 cancer cases recorded in an Independent Advisory group report chaired by Sir Douglas Black in 1984. But neither he nor three separate enquiries conducted by COMARE (a committee appointed by the Government to monitor environmental radiation) (West Cumbria, 1986, Dounreay, 1988, and West Berkshire, 1989) found sufficient ionising radiation in the region to justify that possibility.

Even so, no one is denying that the clusters exist, or that they are unusual.

Dr. Leslie Hawkins of Surrey University's department of Occupational health, and a colleague had suggested that the cancers might be the result not of radionuclides but from Calder Hall's emerging transmission lines (Hawkins & D'Auria, 1987). Following up this notion I visited the Sellafield area in September 1989 and correlated such leukemia cases as I could find against the course of the power lines. My task was not made easy to find, on arrival, that Whitehaven's library file on the subject had gone missing, and the Environmental Health Officer at Sellafield, though providing much publicly available data, would not or could not release to me the individual addresses of the cases, nor even the annual amount of electricity delivered to the Grid from Calder Hall (which is not administered by the CEGB, so did not appear in the Electricity Council's 1987 handbook of statistics).

I found that the lymphocytic leukaemia cases were never far from the lines. Another group of cancers, the myeloids, found more often among older people, seemed to cluster not round the lines, but round radio and TV masts and on high ground near the tops of hills. These observations have now been supported to some extent by Helen Dolk and coworkers' 1997 epidemiological study at Sutton Coldfield.

Nancy Wertheimer had nevertheless now pointed the finger at the effect of low-level electromagnetic fields on organic life, drawing attention to one early experiment at Wisconsin on the slime mould *Physarum polycephalum*, which found that cell division (mitosis) was inhibited by ELF EM fields (Goodman, Greenbaum et al., 1975). This study was in connection with Project Sanguine, the proposed ELF transmitter to be set up in that State.

Ben Greenbaum is now the amiable editor of the BEMS Journal, and still carrying on similar studies 20 years later. I remember having a pleasant breakfast with him in the pleasant French Provincial town of Nancy during the EBEA Congress only a few years back. Navy and other Sanguine research had found that similar effects to the slime mold inhibition could also be brought about in seedlings (Coate, 1970), Other studies found inhibitory effects on chick growth (Krueger, Giarola et al., 1972), rats (Persinger, Lafreniere et al., 1974), and embryonic tissue cells (Yates, Chang et al., 1975). Later Dan Lyle and his team at Loma Linda, California were to prove her right even so far as human T-cells were concerned (Lyle, Ayotte et al., 1988). She had also carried out her own (unpublished) occupational study and detected that there was an increased risk of cancer among people working in electrical occupations.

Not unnaturally the U.S. power utilities were quick to respond to this potential threat to their operations. They set in motion research aiming to replicate, and hopefully thereby to disprove, the possibility that their wires were causing cancer in children.

By 1980 another survey had appeared, funded by the power utilities, analysing childhood leukemia in Rhode Island and its relation to wiring configurations. The authors found no statistical relationship (Fulton, Cobb et al., 1980).

As Wertheimer and Leeper pointed out later (Wertheimer & Leeper, 1980), this was not surprising:

In studying their 110 cases of childhood leukemia Fulton and his team had restricted the reference distance to 46 metres from lines. When Wertheimer and Leeper corrected this data for a bias in the controls towards urban residence (and thus greater exposure to high current configurations), the elevated risk was confirmed

even in the Fulton study. Fulton had also made an error in assuming that the fields attenuate with the inverse square of the distance instead of its simple reciprocal. Accordingly the cases and controls were redistributed towards the lower dose categories, and thus appeared non-significant.

The Wertheimer -Leeper criteria for high wiring configurations were:

Distance from Wiring

a) less than 130 feet from one three phase primary (large gauge)

or more than six primaries (small gauge)

b) less than 65 feet from three to five secondaries (before any service drop)

c) less than thirty feet from a first span secondary (before any service drop)

By a service drop she meant that it was the first house after the current had been transformed downwards from 7,600 volts (primaries) and that there was no loss of voltage from the 240 volts (secondaries).

In the U.K. the nearest equivalent is where an 11,000 volt or 6,600 volt line is transformed down to 240 volts. These transformers too are often hung on poles near houses. I have been called to a farm in Somerset where the wife who lived in the County for thirteen years had begun experiencing health defects after two years in residence. (The farmhouse was right out in the country, with no other near neighbours, and the transformer was only about twenty metres from the property). She suffered from chronic asthenia, severe loss of weight, colonic complaints, candidiasis, and sleep apnoea, all too familiar symptoms of an immune deficit.

The electric fields inside the house were fairly normal on the ground floor, but upstairs in the bedrooms were abnormally high, grading down from 70 volts per metre (V/m) at the end nearest the transformer to 30 V/m furthest away. As if from instinct the farmer's wife was now sleeping in the furthest bedroom, but this was still several times the residential norm of around 5 -10V/m.

This is a typical situation: doctors were baffled. There was no response to treatment by their drugs, such as Caprosin, and Prosymbioflor, and an expensive oxygen machine did not have any real impact on the chronic ear nose and throat problems which the lady had experienced for years. The illness was also undoubtedly exacerbated by a road accident a few years back.

My advice was to ask the Electricity Board to move the transformer to a more distant pole, which would have inconvenienced none. To date this has not been done.

Another of Nancy Wertheimer's detractors was Dr. Morton Wheeler, (funded by the U.S. Department of Energy at Rochester University), who claimed in a letter to the American Journal of Epidemiology that the magnetic fields from the lines were lower than those propagated by a 150 Watt lightbulb (Wheeler, 1980). She pointed out in reply that this would only be the case if the lines are perfectly balanced. Indeed I have measured fields inside bedrooms well over 70V/m (remember the normal strength in the room centre of any home is about 1-10V/m (Doll, 1992)) which disappear the moment the mains electricity is turned off, proving that it is the domestic internal wiring circuit which caused the high field there.

But the lines which Wertheimer and Leeper researched are not really the high-voltage lines we associate with pylons: they carried only a fraction of the current transmitted by the huge 132, 275, and 400 kV lines criss-crossing Britain, of which there are 19,000, 4,000, and 9,800 circuit kilometres respectively (Electricity Handbook, 1987). In America these lines can be as high as 765,000 volts.

The fields induced by the latter types can be measured well over 100 metres away from their midspans. For example, the electric fields from the twin 132kV lines emerging from the north of the Calder Hall power

station exceeded 50 V/m at a distance of 110 metres and at a height of 1.5 metres from the ground (the height of a standing person's head). These lines therefore irradiate the edges of the villages of Beckermot, Moorhouses, and Cleator Moor to the north of Sellafield, and the southern 132kV line irradiates part of Drigg to the south. All these villages have witnessed cases of childhood leukaemia in recent years (Black, 1986).

Like Wertheimer, no funding was available to me for this research. All of us have paid for it out of our own pockets, despite offering proposals for funding to a number of charitable and Government agencies like the Cot Death Research outfit in Bristol, The Foundation for the Study of Infant Death (whose new president, Ms. Erica De'Ath, even poo-pooed my research in the press. When I pointed out to her that the research she was quoting actually supported my argument she blamed her own research department!), and the Medical Research Council.

The same problem confronted Lennart Tomenius, a medical officer with the County of Stockholm, Sweden. He too nevertheless went ahead with his own financing, but since in Stockholm the residents are fortunate in having most of their electricity delivered via buried cables (which may explain why cot deaths are so low in that country), Tomenius chose to measure the actual field strengths at the door of the cases and controls' birth residences, and to note any kind of electrical transmission structure within 150 metres of them (Tomenius, 1986).

After analysing his data, which embraced some 2098 homes of under eighteen year olds, he too found that twice as many of the homes of children who had developed cancer were near 200 kV lines as were the homes of the control children.

To chronicle in detail the subsequent arguments between the power authorities and these often unpaid epidemiologists might begin to bore the reader. Suffice it to say that the design of many of the utility-funded studies somehow seemed to avoid the issue: Myers, for example, in 1985 reported a negative result, yet conceded that upto 15 percent of the cases had been excluded. He also restricted his data to cases within 100 metres of the lines, when it is clear that abnormal fields are found further away than this (Myers, Cartwright, 1985).

Another study by Michael McDowall looked at 7920 cases of death of persons living within 50 metres of electric transmission facilities in East Anglia at the time of the 1971 census (McDowall, 1986). The study excluded underground cables, which is a pity, because the Eastern Area Board has more underground cables than any other by almost a factor of two. It also took the residence date at the time of the census rather than the time of birth, and then tried to see whether more than a proportionate number of people had subsequently died. Only 19 of the many thousands in the sample were living within 30 metres of an overhead powerline, and the majority were living near to the metal-encased substations transforming current downwards, which thus had their own built in faradic protection. Not surprisingly McDowall's study found no positive results, though when he had previously examined the fate of people working in electrical occupations a correlation between ill health and electricity emerged (McDowall, 1983). Commenting on this study Valerie Beral rightly points out (Coleman, Beral et al., 1988):

"The extent of migration of study subjects away from their 1971 address during the 12-year follow up is unknown; this lessens the certainty of their exposure classification, but it should be noted that the effect of this would be to bias the results towards the null hypothesis".

Ms. Beral mentions another survey of leukaemia incidence close to power lines carried out in four London boroughs and relating to cases between 1965 and 1980 (Coleman, Bell, 1989) which again pointed to an increased incidence of lymphatic leukaemias (though of not other types) among people who lived less than 25 metres from a powerline, the relative risk being 1.76, falling to 1.45 at 100 metres. The risk from living near a substation was less at only 1.3, but all these figures really mean that there is a hazard to health, since the normal relative risk would be only 1.0

No one seems to have taken much notice of these findings, perhaps because they were published in a rather

restricted set of conference papers. What I draw the reader's attention to, though, is that it is always the lymphatic type of leukaemia which shows raised incidence. In other words, something has happened to the human lymphocyte competence in the bloodstream as a result of exposure to electromagnetic fields. The significance of this may become apparent when I talk more about AIDS later.

The sad fact is that the former CEGB's attitude in its newly privatized form the National Grid Plc. appears to be one of minimal research into health effects: despite a budget of £100 million to promote its good image to the public in the run up to privatisation, only some £500,000 is being put up by them via the EMF Biological Trust for external research into health hazards, and even this was a grudging and belated response to a court directive following the Innsworth enquiry a decade before (described in Smith & Best, 1989). Mostly they provide staff assistance and the free donation of Emdex monitoring machines which until scientists including me created a fuss about it only measured magnetic fields. One has to ask, given the gravity of the problem, whether this is an adequate response.

Their funding (for some of which I have unsuccessfully applied almost a half dozen times!) compares with \$5 million spent on the New York State Power Lines Project researching the biohazards of electricity transmission in the U.S., some \$6.1 million by the American EPRI between 1985 and 1987, and a further \$16.7 million budgeted by them between 1988 and 1990. The US Congress RAPID Program aims to spend some \$65 million by the time all its studies are completed, and new Australian and WHO initiatives are also multimillion figure research projects.

*Atqui quis custodiet ipsos custodes?* is a Latin tag which I now tend to translate as 'Who will put those responsible into custody?', since I guess that if the Green Party ever got into power in Britain there may be more than a few environmental prosecutions for wilful negligence. Given this nonchalance by the authorities, what can we, the people, do about it on a practical scale? To start with here are my own suggested guidelines for how near to a power line one might safely live:

"As a rough guide never allow yourself to sleep in an electric field exceeding 10 volts per metre". I said these words in my first edition of this book (called *Electropollution*) in 1990, and am quite pleased to see that this objective is the ultimate recommendation of the National Council for Radiation Protection and Measurements (NCRP) of the US. Young children should ideally not be allowed to sleep in any electric field at all, because of its effect on their cell division and long term genetic structure. Since electricity has only been used this century, the long term hazards may not yet have become apparent, and there may simply be no safe low level.

If you are not able to comply with these admittedly somewhat arbitrary criteria based on cases I have personally encountered, plus a careful reading of published scientific results, then there are still protective measures you can adopt.

First you can screen the worst effects of electric fields by growing trees between your house and the lines. Remember that the worst fields are found at the mid-span rather than nearest the pylon itself. Fast growing conifers like *Cypressus leylandii* are good for this purpose, though shrubs can also be used to stop the effects at low level.

The problem is that most people sleep in the upper rooms of their house where such fields are generally higher. In such cases I suggest that you choose for the bedrooms those on the side of the house furthest from the line, or if possible sleep downstairs.

Next, remember that the human brain will adjust as best it can to any adverse fields, and that if you go away, on holiday for example, your brain will be unprepared for the adverse conditions on your return.

Perhaps you have noticed that you often catch a cold just after coming back from holiday, or that the first night away from home you simply cannot seem to get to sleep. Psychologists conducting sleep experiments are well aware of this 'first night' phenomenon, and discard any results for that time. ME sufferers too often report the first onset of the condition just after returning from a foreign holiday.

Some people ask me whether they should construct a Faraday Cage in the bedroom in which you can sleep. Typical proposals consist of a copper sheeting all round the walls and ceiling which is very expensive, or a metallic coated material used as a cover for the bed. The latter is a more sensible and less costly option. I have developed such a material and in the course of doing so discovered that not many conventional metal threaded materials were any good. The windows can be protected by this sort of metallic mesh, which thereby still admits light and air.

As a makeshift, aluminium kitchen foil under the mattress will protect you from fields beneath the bed, but quickly gets exhausted after about a week and will need replacing unless you have earthed it well to the ground outside by means of a copper wire and piece of metal tubing hammered two feet into the soil.

Before resorting to such desperate measures it is a good idea to test the concept by switching off the mains electricity at night for a few days to see if you sleep and feel better for it. Many older models of mains give off quite high fields, and should be replaced by new metal (not plastic)- clad mains and fuse boxes.

Stopping the effects of magnetic fields is much more difficult than stopping electric fields, but as the Miller study shows these do not appear to have such an important biological effect as the electric field. They attenuate much more slowly and can get through most substances, especially water, of which human beings are mainly composed. That is why you can use a magnet to recover keys which have fallen down a drainhole full of water.

The magnetic field from a powerline comes out perpendicular to the line. By sleeping at right angles to the line therefore you are minimising your exposure to its lines of force. Metals concentrate these force lines, so avoid sleeping with any metal objects near you, e.g. the radiators along the wall, or metal bedsprings. It is not so much the steady field which causes the damage as the changes which result from varying calls on the electricity supply down the nearby power line.

The brain seems able to handle a steady field, even if it is pulsed at ULF frequencies, much more easily. That is why a single measurement of a magnetic field tells one little about whether the location is dangerous: it is the extent to which the field varies during a period of time that matters.

Many sufferers from insomnia have found relief by using a palm sized gadget which pulsates at around 2Hz. There are several on the market, including the Max Stress Controller, the MiniBio, the MDI Empulse, and the Medicur. They are of varying degrees of sophistication.

By contrast, if you are continually crossing lines of magnetic force in a geopathic stress zone for example, an adverse same effect occurs.

The effect of an ordinary magnet on your colour TV picture is likely to be temporarily catastrophic if you bring it close to the screen. Not only will it distort the image but the people on it will end up with green faces for a few hours! It is possible that the brain too is affected even by static magnets such as are often incorporated in electric motors. If someone turns on a single electric light switch somewhere in the house, your brain will register the change and alter its EEG rhythms accordingly as several studies have now shown.

In one experiment with identical twins it was found that the brain of one twin thus affected even caused a change in the EEG record of the other, even when they were in different rooms (Duane & Berhendt, 1965). Hans Berger would have been interested to know that!

It is my personal opinion that this interpersonal communication might form the basis not only of telepathy, but also afford a mechanism for the transmission of progressive genetic ideas. This notion that species once having learnt something can transmit their learning to others of their kind so they learn it quicker, is being developed by Rupert Sheldrake, a biologist who caused a rumpus in scientific circles when he first published his hypothesis (Sheldrake, 1981), which he called Morphic Resonance.

Sheldrake has been looking for a mechanism whereby such genetic ideas seem to be transmitted faster than Darwinism and natural selection would allow. My CMR theory helps explain how evolution proceeds much faster than traditionally thought. Given such incredible biological sensitivity to electromagnetic radiation it is not unlikely that even the distances I have suggested above may be too near. Only more research and time will tell.

Meanwhile, it's perhaps better to be safe than sorry. We are beginning to know how to recognise the initial signs of electrostress, thanks to a pioneering set of studies by a Birmingham doctor, Stephen Perry (Perry, Reichmanis et al., 1981; Perry & Pearl, 1988). Once again Perry had to pay for the cost of his research out of his own pocket. He examined the addresses of some 600 suicides reported in the Birmingham area, and found that homes where the magnetic field as measured at the front door was relatively high (above 1mG), the relative risk of depressive illness was elevated ( at 1.5).

I once found a similar effect in the housing estate of Fernhill, Mid Glamorgan, and in discussing this with several residents who had not been there long was told that since arriving on the estate they had become depressed, and would be glad to leave. There had also been two suicides, not to mention many acts of violence and at least one murder there. A Yorkshire TV programme on stress found similar tendencies among VDU-operating credit managers at a large finance company, Lombard North Central.

The lesson is clear: if you find yourself inexplicably depressed or suicidal and live near a power line, it's time to get out, before some tragedy occurs. Perry's results, which were found to occur even when the HV lines were buried and the subjects were unaware of their existence, were confirmed by Russian studies which also identified cardiovascular effects (e.g. Kuksinskiy, 1978 ).

I was able to demonstrate this to a resident of Fernhill who lived very near the 132kV line by suggesting that he turned off the mains electricity. He immediately reported, literally within seconds, that the pressure in his neck had subsided, though at that time he had no idea of the research which had already found that blood pressure is affected by electromagnetic fields. So high blood pressure (which can also lead to aggression) is another pointer for you. And if left, you may, like the inhabitants of Fishpond in Dorset where a powerline stretched through their village (see Hilary Bacon's account in Smith & Best, 1989), also suffer from hypertension, epilepsy, dizziness, and other heart conditions, even death from cardiac arrest.

Make no mistake, no matter what the official denials claim, the scientific evidence, let alone my own personal investigations, have convinced me that these risks are real and seriously under-reported. It is hardly surprising that the electricity utilities deny it. After all, as a famous call-girl Mandy Rice-Davies once said of another politician caught in flagrante delicto, "They would say that, wouldn't they?"

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