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Science commentary: Power to confuse

Geoff Watts

Ever since Nancy Wertheimer of the University of Colorado reported her 1979 findings of an excess of cancer in children living near overhead power lines, seldom has a year passed without a flurry of public debate over the safety or otherwise of these ugly (the one thing all parties agree on) but essential installations.

Much of the argument has been about the very existence of the alleged hazard. As recently as last month, the organisers of the 15 year UK childhood cancer study declared that "perceived risk factors such as living near sources of electromagnetic fields . . . are not principal causes, if at all, of leukemia in children." But a clutch of studies reporting a positive association—of which this week’s by Draper and colleagues is the most recent—has encouraged researchers to continue investigating possible mechanisms.

Electrical and magnetic fields can induce currents that might alter the voltages across cell membranes. Magnetic fields might cause the movement of ferromagnetic particles within cells. They might also influence free radicals: atoms with unpaired electrons that are highly reactive and play a part in all sorts of biochemical processes. Low frequency electromagnetic fields have been said to alter the progress of cells through the cell cycle and reduce the effectiveness of the immune system. Power lines might even deflect and concentrate cosmic rays on people living within their vicinity. Evidence to support these and other ideas, however, is at best thin and at worst non-existent.

One of the more recent attempts at identifying a mechanism sidesteps the need to invoke direct effects. For the past 10 years or so, Bristol University physicist Dennis Henshaw has been working on the influence of electromagnetic fields on the deposition of airborne particles. The relevance of this to power lines entered public consciousness in 1999 with the publication of two papers by Henshaw and colleagues. High energy power systems, they pointed out, cause some breakdown in the surrounding air molecules and so generate positive or negative ions. The systems are...