

## Culture, Technology and Radiofrequency Effects July 2020

Technology can be wonderful and bring great benefits. The story of the last 5000 years is of incremental technological advances, success, and the progressive empowerment of humans with the opportunity to raise human consciousness. We have seen the clearing of forests for agriculture with iron tools, then the wheel, next straight roads to communicate with Rome, aqueducts and bridges. Further revolutions (periods of rapid evolution) have followed. In the Middle Ages, literacy and the printing press, then agricultural, industrial, power generation (wood, coal, oil and electricity), transport (railways then roads on land, ships on sea and air travel), electricity, communication, all allowing communication and personal travel, and the projection of power and will. Recent advances in information technology have allowed amazing leaps forward, and a world wide web, that parallels the invisible web of consciousness that permeates everything (according to modern physics – Jude Currivan). Great!

All these human advances allow better, more fulfilled lives for many. It seems as though mankind has mastered external use of the elements of earth, fire, air and water. If the purpose of technological advance is purely to have more comfortable lives, then technology has served us well, despite setbacks. However, if the purpose is to serve the fulfillment of personal potential – that is, the growth of human consciousness, then we may be missing a trick. The Roman Emperors knew how to control the restless million inhabitants of Rome – by diverting them with *panem et circenses* – a free corn supply for bread, and circuses. Perhaps our modern equivalent is plenty of plenty of food and comfort, and 24 hour screen time...

There are three important aspects of problems that apply to Radiofrequency and Electromagnetic (RF or microwave) Field technology:

### 1 Safety always lags technology.

We see this time and again – on the first day of a public railway in Britain, the Liverpool and Manchester, MP William Huskisson was run down by a train. Improvements in safety stopped trains travelling towards each other on the same stretch of track, then signaling became more sophisticated, and so on. The highest rate of road fatalities per mile travelled was in the 1920s – lack of driving skills, unsafe cars, and poor road surfaces all contributed to this. Resistance to safety always comes from the industries – the railways had to be cajoled by the Railway Inspectorate (HMRI), and on roads in the 1960s the introduction of safety belts was resisted by libertarians, anxious to allow people the right to exit a motor car via the front windscreen – and by the manufacturers, because of cost.

### 2 Safety limits are set – but by whom, and for whose benefit?

Current EMF safety limits in much of the Western world are based on the assumption that only thermal (heating, power) effects are hazardous to health. Safety limits set by the body ICNIRP are six minute thermal effects only – if the source heats biological tissue by over 1 degree Celsius within six minutes, there is deemed to be a problem. If it takes 7 minutes, 60 minutes or six hours, then this is not covered by the safety limits. However, biological systems react to extremely low power signals – our eyes can react to a single photon with a cascade of biochemical reactions, whilst our ears can detect a billionth of a watt when in silence - these are neither power nor thermal effects. Living systems are affected by signal at a power many orders of magnitude below thermal effects. **The adverse effects are Signal, not Power – which invalidates thermal safety limits.** Mechanisms include effects on the voltage gated calcium channels amongst others, and affect fertility and many other systems, thousands of research papers show the adverse effects on biology. Many governments have chosen to follow ICNIRP, which favours industrial output, rather than biological limits - that protect human health, bees, insects, and nature, despite thousands of scientific studies showing harm at levels well below thermal. **Non-thermal does NOT equal non-harmful.** Parts of the insurance industry describe EM and RF fields as 'pollutants' and decline to provide indemnity cover. Swiss Re warned in 2013 of the potential High Impact of unforeseen risks of electromagnetic fields on a 10 year view [https://media.swissre.com/documents/SONAR\\_+Emerging\\_risk\\_insights\\_from\\_Swiss\\_Re.pdf](https://media.swissre.com/documents/SONAR_+Emerging_risk_insights_from_Swiss_Re.pdf) What does this say? Also, exposures are often 'talked down' as part of a 'spin' approach – e.g. one company claimed that its smart meters only transmit for six seconds a day - the truth in this case is that their meters transmit 14000 times a day for a few microseconds – maybe 6 seconds in total - but we know that 14000 brief blood curdling screams do not average out as silence! Or mm wave are only 'low power' – when the problem is not power, it is signal. Low power does not equate to low harm, when the problem is signal.

### 3 Sadly, society can be led astray, even into danger.

Many people use devices, whether mobile phones, pads, tablets, home Wi-Fi, smart meters and so on, on the basis that “**they wouldn’t let us use them if they weren’t safe, would they?**” – and the technology IS wonderful in providing information and connection. Many of us, especially the young, are addicted to our devices and treat them as comfort blankets – in fact some of the algorithms in the software are designed to hook our attention. Once the hazards of any new technology become apparent, there is always a slow movement from denial (there isn’t a problem, there isn’t a problem) and “there are a few mad people who say there’s a problem” to grudging acceptance “there’s only a small problem and it’s completely under control” to “Houston, we have a problem” – that is, final understanding of the major significance of the issue. We’ve seen this with tobacco, asbestos, lead in petrol, radiation in pregnancy and other issues, all advised as SAFE by the industries involved, and sometimes by health advisers. It is so much easier to *blame the messenger* than listen to the message. But as they say in the airline industry – safety may be expensive, but the cost of a mid-air collision... Also, *cui bono?* Is the rollout of every piece of new tech to the long-term health benefit of the purchaser and society – or more for the profit of the tech developers... How can continuous irradiation of living spaces and vehicles, felt as symptoms and impaired cognitive function by some, and known to cause harms, be health-giving?

There is a fiction that, because ionizing radiation is known to be dangerous – that therefore non-ionising radiation is non-dangerous – unfortunately a flawed assumption, nor a logically sound conclusion

#### In summary

1. Technological advances can be wonderful and (*sometimes*) bring great benefits.
2. **Safety always lags technology.** Those who profit frequently resist the safety costs
3. Current safety limits are six minute thermal only – this does not respect biology, and is based on the **falsehood that non-thermal equals non-harmful**
4. **Only power effects are considered – signal effects are ignored. Biological systems however respond to signal**
5. Harms are often not initially apparent, and are then denied – often using vociferous **active denial**, by those who have vested interests, whether financial or from a belief system. There can be a wanton (hopeful) and groundless **presumption of no harm.**
6. **NON-ionising does NOT mean NON-dangerous**
7. Technology should be used wisely and serve, not master, human development.
8. Science tells us there is a problem, but regulators and industry are not yet listening

The future is potentially hopeful – but ONLY if harms are recognised and mitigated. Some worry about incremental fertility failure, because a girl’s oocytes can be damaged by RF, and mitochondria (the ‘power houses’ of the cell) affected, we already know that sperm quality is degraded by RF.

Where next for humanity? Will humanity help every individual develop their consciousness and awareness – genuine support of human development? or be led by the market, adopt dopamine dependent advances, become captivated and dazzled by desire and appetites? Will rollout of technology continue to cause damage to environment, and our own human health (health including harmony of mind, body and spirit)? Will vested interests and clever lobbyists drown out and subvert common sense and wisdom, seduced by the power of detailed information and surveillance, and the promise of power and new markets? Will society continue Active Denial both at personal and institutional levels, or will we wake up to the issue, listen to those who are affected adversely, and learn the ways of health – as well as reducing invisible pollution levels?

A challenge ahead for humanity is to use Power wisely, admit mistakes, forgive, and move forwards with respect for nature and for each other. Andrew Tresidder July 2020.

For intellectual barriers to progress, see Six System Problems in Scientific Thinking in Health and Self Care [www.healthandself.care](http://www.healthandself.care) pp 30-34. For many references, see [www.es-uk.info](http://www.es-uk.info)

Two very recent useful papers are 1 Stein and Udasin 2020 on Electrosensitivity <https://www.ncbi.nlm.nih.gov/pubmed/32289567> and 2 editors of Handbook of Biological Effects of Electromagnetic Fields, Barnes and Greenebaum, 2020 on setting exposure limits <https://onlinelibrary.wiley.com/doi/abs/10.1002/bem.22267> who make the important point in the abstract that Current limits for exposures to nonionizing electromagnetic fields (EMF) are set, based on relatively short-term exposures. Long-term exposures to weak EMF are not addressed in the current guidelines. Nevertheless, a large and growing amount of evidence indicates that long-term exposure to weak fields can affect biological systems and might have effects on human health. If they do, the public health issues could be important because of the very large fraction of the population worldwide that is exposed. The whole paper has over 50 references.