Origins

Debriefing spies during The Cold War extended my military education into the full diversity of stealth microwave warfare and communication systems. I was previously aware of reports concerning dead birds in and around communication bases. On examination these birds were found to be cooked. Microwaves are the preferred medium for communication, over radiowaves, due to their superior penetrative properties and ability to carry more information.

Our Government and the International Commission for Non-Ionizing Radiation (ICNIRP) classify microwaves as electromagnetic waves from 300 M Hz to 300 G Hz. (NRPB 2004).

To my knowledge, 'microwave or radiowave sickness' was first reported in August 1932 with the symptoms of: severe tiredness, fatigue, fitful sleep, headaches, intolerability and high susceptibility to infection (Hecht, 2007). These symptoms were reported to be from athermal effects.

Obviating these health risks mediated by what ever mechanisms seemed to be the rationale for those setting safety levels (Marino, 1995). Marino writes: '*.....the present de facto in arriving at a determination of a safe exposure.*' Marino's research (Marino, 1995 op.cit) was based on EMF exposure – radar and radios – on service personnel during World War II.

During the Cold War the US Embassy in Moscow was irradiated with low level microwaves for many years; why and how is really outside the scope of this article. The consequences of this irradiation were multiple cancers / leukaemias and other illnesses among embassy staff and families. Professor John R Goldsmith, MD wrote the investigative report on this incident (Goldsmith, 1997). Professor Goldsmith wrote a corollary to his initial publication (Goldsmith ii – undated) where he described modern communications as 'The End of Innocence'.

By 1971, the US Naval Medical Research Institute (NMRI) referenced 2300 research articles listing in excess of 120 illnesses attributed to radio frequency and non-ionizing microwave radiation. Under the Freedom of Information Act, extracts from published US Defence Intelligence Agency Documents confirmed the NMRI research stating: '*If the more advanced nations of the West are strict in enforcement of stringent exposure standards, there could be unfavourable effects on industrial output and military functions.*' (DST, 1976).

Very critical of the US Government and World Health Organization, Leonard David's report for the US Department of Energy (research) in 1980, likens governmental and industrial reluctance to act in a precautionary manner as similar to that of the Tobacco Industry. He writes:'*.....despite the 40 million medical documents related to its damages in all organs and tissues, neither the US Government nor the WHO were willing to take action. Cell phone telephony will necessarily follow the same path. And the WHO....and ICNIRP are there to help industry.....*'. (David, 1980).

Microwave sickness was well documented by 1997 (Grant, 1997) where over 100 further research documents were referenced.

The first cell tower to communicate with a mobile phone was in 1985 with the late comedian Ernie Wise, although this industry never really became established until the 1990s (Shabi, 2004). Consultant Solicitor and Government Adviser, Alan Meyer, wrote (Meyer, 2004) that there was concern over insensitive siting and public's well-being with microwaves. His report reflected the

'Expert Groups Stewart Report' in the spring of 2000. Professor Hyland argues that any view contrary to *'prevailing officially perceived wisdom'* is at worst silenced, or, at best, studiously ignored (Hyland, 2001). It is what I tend to call 'intentional ignorance'.

In a documentary film, the late Carl Sagan says: *"We've arranged a global civilization in which the most crucial elements profoundly depend on science and technology. We've also arranged things so that almost no one understands science or technology. We might get away with it for a while, but sooner or later, combustible mixture of ignorance and power is going to blow up in our faces."* (Sagan, 2009).

Technology

The reader may presume that a 'microwave cell' is one tall transmitter; in fact it refers to a hexagonal area with a transmitter at each apex. The size and shape of cells varies enormously, ideally they would be a few square kilometres. Each transmitter will cover 120 degrees at one of its three sectors. Sometimes there is a special requirement for additional coverage in buildings, here, picocells are used. Bridging the gap between macrocells (tall transmitters) and picocells, there are microcells which may be added, eg in high streets for shoppers.

Each transmitted signal is cut-up into time slots. Different channels co-exist within each time slot. One of these channels is an information carrying broadcast channel and others carry calls. Each tall macrocell may have in excess of one hundred channels transmitting from each of its three sectors.

Several time slots are called a frame. Several frames are transmitted each second with one acting as a synchronisation frame.

Carrier waves may be used to carry information which can be superimposed on them by modulation. This would be video or audio data.

Scientists argue over what constitutes a modulation or pulse. A modulation is a superimposition of data upon a carrier wave; modulations are usually connected with an infinitesimally thin thread of 'energy'. A pulse has no such attachment to the following pulse. A reader may wonder why this distinction is relevant. Some scientists blame pulsed microwaves for various biological reactions within our cellular structures which they believe cause illness.

An opposing view is that these pulses are in fact modulations and will not cause such reactions. Further arguments suggest that there is no biological difference between a frequency modulated transmission or pulse when it comes to resonance with our cyclotronic and circadian rhythms.

Transmissions may be directional or isotropic (equal in all directions), may be analogue (continuously variable quantity eg spatial position) or digital (sometime called 'frequency modulated'). However, all transmissions are electromagnetically propagated. In the world of nuclear and atomic physics, electronic switches can make tens of millions of decisions a second and all transmissions travel at the speed of light (roughly seven times around the World each second).

Transmissions can be increased, by possibly up to 40%, with side lobe technology.

Vector mathematics can demonstrate whether any of these transmissions are incident upon another transmitted wave eg low frequency radio wave, as there can be a piggy-back effect (constructive interference). It is argued (Curry undated) that this amplification of electromagnetic signal can pose a health risk for those in close proximity to a transmitter.

Modern innovations evolve almost daily with this technology. Initially, networks offered a download speed of roughly 350 kilobits each second with an upload speed of roughly 120 kilobits. Today, 100 megabits to a gigabit are being mooted. This would allow a DVD to be downloaded in seconds.

The mobile network can now: transmit your energy usage to the required authority, provide the location of vehicles, parcels being transported, switch frequencies if the one you require is busy (Ashley 2006), focus on your position with phased-array antennas (Cooper 2003), even track your movements as you 'log-on' to each new cell.

Possibly a more sinister use for this technology is the ability for all calls being transmitted to be intercepted, logged and stored. According to one director of computer security (Hurst 2009) even if a mobile phone is turned off, it can in some cases, be activated so that it becomes a listening device. To ensure confidentiality at meetings, phones are now shut in metal boxes or owners remove batteries. Hurst is quoted as saying: *"Almost all mobile phones have a secret listening function that can be activated by a computer code, which a phone operator can send without the owner of the phone realising it."*

Two examples of developing technology are CellDar and M-Health Innovation Centre.

CellDar has been in development for about 10 years. It is in effect a mobile transmitter radar. Microwaves, normally used in radar, from transmitters can selectively track individuals or vehicles. Computers can eliminate static objects eg trees, buildings etc which will make surveillance easier.

Several writers (Bush 2001, Muller 2008, Burke 2002, Grossman 2003) describe this system and discuss the benefits to security and the possible invasion of civil liberties.

M-Health is an amalgamation of innovative mobile technology and the University of Manchester to conduct multidisciplinary research with researchers, healthcare organisations and industrial partners. One proposal is for patients with psychotic disorders to record their medication / symptoms via their mobile phones: (GSMA 2009).

Placement

Placement of transmitters is a very emotive subject, if for no other reason than 'uncertainty' over possible ill health effects. School playgrounds can become areas of unequivocal contentious dispute. Government advisory scientists recommended that for macrocell base stations (tall transmitters) sited within school grounds: *'the beam of greatest intensity should not fall on any part of the school grounds or buildings without agreement from the school and parents. Similar considerations should apply.....near to school grounds.'* (NRPB 2004).

The above recommendation may have been in response to a legal action taken by a Head Teacher and Governors of a primary school objecting to plans for the installation of a nearby transmitter. (Benson 2003). In her appeal, Mrs M Benson sites a legal judgement by Mr Justice Richards: (Richards 2003), where His Honour asks the question: *".....not is this an acceptable location?"* but ....His Honour continues: *"If one of the sites were close to a nursery school.....whereas the other was in an industrial estate some distance away.....the greater public concern about the former might tip the balance against grant of approval for it."*

At a conference, I did ask why school grounds were favoured above industrial estates. I was given the reply that industries knew how to negotiate for rent whereas schools didn't! Also, schools needed income.

So where did this fabric of integrity concerning reassurances by Government, its scientists, researchers and industrial spokes-persons, break down?

Three years earlier, the Scottish Parliament's 'Masts Report' backed the introduction of full planning control for 'masts' and the avoidance of residential areas: (EH&T. 2000). It states: *'Based on evidence.....there is reasonable doubt about health risks.....a precautionary approach should be adopted.'*

The 'International Commission on Non-Ionizing Radiation Protection' recommend that decision makers be aware that children, the elderly and chronically ill may have a lower tolerance for microwave exposure. (ICNRP 2002). Also decision makers should read current literature to determine appropriate reduction factors.

In 2009, ICNRP reconfirmed its basic restrictions for microwave irradiation: (ICNRP 2009).

In January 2003, local residents at Wishaw objected to the placement of a transmitter and gave legal notice to T-Mobile citing many instances of different cancers, changes in blood cell counts, skin complaints and neurological problems: (EH&T 2003).

I happen to know in the above case, this microwave transmitter "fell over" and the land owner refused access onto his property necessary for equipment to re-erect the mast.

Placement could confer hitherto unknown responsibilities upon the 'rent accepting' landowners. A High Court judgement stated: *'.....there might occasions when an occupier could be legally liable in negligence in respect of activities which he permitted or encouraged on his land.'* (Brook 2003).

Conflicting advice from Government may cause confusion. An all-party Parliamentary Mobile Group concluded that the voluntary code of practice by the telecommunications industry is inconsistent and leads to public scepticism concerning planning decisions (Willis 2004). In that same year, a Government document states: *'The UK government has given strong encouragement to the development of mobile phone technology. Operators have been given support for the installation of the cellular networks.....'* (NRPB 2004).

Health considerations have taken precedence over industrial intransigence. One legal decision refused permission for a transmitter, stating: *'the industry could not give a competent assessment of the likely effects on the health of local people.'* (Jarvis 2004)

In a document for the Health Protection Agency, Consultant Solicitor, Mr Alan Meyer, confirms the international jurisdictive status of health protection. (Meyer 2006). Meyer writes: *'.....it is no longer possible in planning matters to instruct local planning authorities that "health effects and concerns" should not be considered.....this guidance no longer confirms with articles 6 and 8 of the European Convention on Human Rights and the Court of Appeal Judgement in Newport-v- Secretary of State for Wales.....And secondly to comply with the requirements of the UN 22 Standard Rules on the equalisation of opportunities for persons with disabilities.'*

In terms of 'risk communication' and the uncertainty from base station emissions, a Governmental advice document clearly states: *'Risk communication on this topic is not the preserve of government. There are many competing risk messages available to the public (eg from pressure groups, from the industry, and from disparate scientific experts).'* (MTHR 2007).

Health

Advancement in microwave technology, since the Cold War, necessitated concurrent experimentation. Thousands of research studies exist concerning ill effects from low level, below thermal irradiation levels, involving almost every organ in the body. Possibly the most comprehensive explanation for this phenomenon is written by Dr Goldsworthy of Imperial College London: (Goldsworthy 2007).

Research suggests children and women exhibit more vulnerability to illnesses from irradiation than adult males. Children have less dense bones, immature immune systems and, by virtue of their size, they can act as aerials. Females have more complex hormone based systems to be disrupted than males.

As a research physicist, I receive many phone calls. One lady caller (Sharlotte (i)), said *"Barrie, my daughter has just died. She was 12 years old and number 12 to die since this transmitter went up 18 months ago."* Sadly this was not the first time I had received such a call. This particular call lasted about two hours. By 2003 a 19 page international report had been published listing in excess of 130 such clusters near schools: (Schools 2003).

One MP (Spring 2004) reports a case of eleven children under the age of eleven years, all with leukaemia, living within one half of a mile from a transmitter.

During my address to the Welsh Assembly (Trower 2006), I referenced a further 47 such clusters.

In their 2009 report, the International Commission (ICNRP 2009) writes: *"Another gap in the research is children. No study population to date has included children....."*

Some experiments can be linked to children: (Panagopoulos 2006). Low level mobile telephony radiation was found to disrupt the bio-chemistry of follicle cells in a mammalian egg chamber. This could have repercussions involving mitochondrial damage which, if genetic, can be passed from mother to daughter in perpetuity.

A worldwide epidemiological study (ECOLOG 2000) was commissioned by T-Mobile, on its own product. One of the conclusions was: *"On the cellular level, a multitude of studies found the type of damage from high frequency electromagnetic fields which is important for cancer initiation and cancer promotion."* This document also describes DNA damage on the same page.

The reader will appreciate listing and referencing all such epidemiological studies would be too extensive and repetitive for this article; suffice to say, by 2006, it was reported that 80% of epidemiological studies on the WHO database listed microwave illnesses, cancers and psychological factors, from mobile phone base stations: (Guilmot 2006).

One such study (Hallberg 2002) looked at 'before' and 'after' the introduction of frequency modulated transmitters across Estonia. He identified a steep increase in cancer mortality after transmitters were allowed across this country.

On 9th October 2002, the Freiburger Appeal was launched. Initially signed by 270 medical consultants, scientists, GPs, MPs and physicians, it now has many thousands of signatories worldwide. This appeal lists 13 severe chronic illnesses and various disorders involving: behaviour, blood, heart, cancers, migraines, tinnitus, susceptibility to infections and sleeplessness, all ascribed to: *'pulsed microwaves from mobile communications technology.'* (Freiburger 2002).

Assimilating knowledge from the Cold War and other sources, I accumulated a plethora of data describing how pulsed / modulated microwaves interfere with our cellular biochemistry. Believing the communications industry to be spiralling out of control with its new innovations, I published my list on the internet (Trower undated), in the hope that the industry would take note.

When I was commissioned by the Police Federation of England and Wales to write the 'Tetra Report', I highlighted these biological dangers again (Trower 2001). The Minister's response to my questions concerning the dangers from this phenomenon, asked on behalf of the users, was that neither he nor the Home Office had knowledge of this research (Home Office 2001).

In their 200 page health study, the Health Council of the Netherlands warned, '*experimental data indicated effects from microwave irradiation occurred at lower power densities if the microwaves were pulsed*' (Health Council 1997).

Legal precedence has been set concerning health issues and mobile phone transmitters. Mr Wulf Dietrich Rose, expert in mobile communications, won three High Court cases. Rose proved through his studies irradiation represented serious health risks to nearby populations (Rose 2001).

Government revenue and rejoinder to disparagement

In 1991 the UK Government requested sixteen million pounds per annum from each of the main mobile telecommunications networks. This Licence fee would confer their right to a proportion of the microwave band spectrum. Nine years later, auctions have realised a combined value of 22.5 billion pounds (Wray 2007).

To date it has proved impossible for me to find an economist who is prepared to be identified regarding the potential mobile telecommunications annual income tax return.

An "off the record" source suggested an estimate of fourteen billion pounds.

From this income, the UK Government decided to allot seven point four million pounds for researchers to investigate a number of 'important health-related issues' (Winterton 2004).

During the past decade I have attended many UK and international meetings / conferences and advised some Parliamentary committees. Parliaments and other decision-making bodies often refer to the World Health Organization (WHO) and the International Commission for Non-Ionizing Radiation Protection (ICNIRP) as the two authoritative bodies concerning microwave irradiation. In reality there are at least eleven other International Committees who vehemently oppose both the WHO and ICNIRP's safety levels. This is mostly due to the formers' safety levels being based exclusively on thermal levels, whereas other international studies recognize responses to electrochemical interactions between microwaves and cellular biochemistry, and set safety levels accordingly of lower rates. As an example of this difference, the Austrian Committee set a maximum level of irradiation as 0.1 microwatt per centimetre squared. The UK thermal level is 10,000 microwatts per centimetre squared for the 1800 M Hz transmitter.

Commenting on both the WHO and ICNIRP's exposure limits, a scientist wrote: '*This will conveniently provide economic protection for the industry against the need to spend enormous sums of money on upgrading the distribution systems as well as risks of litigation.*' (Maisch 2006).

Governmental intransigence has its critics. The Editor of a prestigious scientific journal wrote: '*Public and Politicians must understand and debate risk.....and agree when the precautionary*

principle must take priority. Advisory committees cannot be stuffed with the great and the good; they must include the lay public and other doubters.' (Editorial 2000).

As author of both Tetra (Airwave) reports, I have obviously learned of the concerns between those residents, or officers, spending many hours in close proximity to these transmitters and the Government who want them up and running. At one time I had knowledge of ninety such disputes. An MP (Turner 2004) complained that the network operator had been given emergency powers to override normal planning procedures.

Further criticism came from the chair of a council who wrote to the Rt Hon Yvette Cooper MP, Minister for Housing and Planning (Parker 2006). Mr Parker complained that if any objections to the erection of a transmitter had not been received within 56 days, 'deemed consent' for erection was assumed by the operator.

Some MPs took to the streets with objecting communities, in order to change planning laws in London on Saturday March 8th 2003. Dr Caroline Lucas (MEP Green Party) said ".....mobile phone masts have a case to answer." Dr Ian Gibson (MP Norwich) said *"We have got to get the health issue put at the top of the agenda....many more people will suffer."*

Ofcom, the Governmental regulator and advisory body for the UK public, was reported to have made an application to the High Court in 2008 (Ray 2008). This news article reported that Ofcom were going to law to prevent the British public obtaining access of their data showing the location of every mobile phone mast in the UK. Some transmitters are disguised as trees or placed inside lamp-posts, church steeples etc.

At this time, a Mobile Business Magazine (IMPOA 2008) reported that after an initial refusal, Ofcom admitted it had received over ten million pounds from the mobile operators for 'running costs'.

Responding to criticism, from electrosensitive persons, the UK Government commissioned research which became known as the 'Essex Study'. This study concluded: *'Short-term exposure to a typical GSM base station-like signal did not affect well being or physiological functions.....'* (Fox 2007).

Controversy immediately followed the Essex conclusion. Dr Blackwell wrote (Blackwell 2007): *'Under the circumstances, the claim in the Essex Press Release: "Study finds health symptoms aren't linked to mast emissions" is open to serious question.'*

The Independent on Sunday (Lean 2008) reporting on similar international studies wrote: *'Critics have attacked the (Essex) studies' methodology, but the new findings deal them a serious blow.....they show that radiation did have an effect, even though people could not tell when they were exposed.'*

Stating the Government's view, The Minister of State, Department of Health (Winterton 2004) said: *"The ICNIRP and UK national guidelines are based on the comprehensive assessment of current scientific knowledge, including the possibility of harm caused by effects other than heating."*

Phone Company Responses

In February 2007 I was invited to give a short presentation concerning low-level microwave irradiation and cancer at London's Great Ormond Street Hospital for Children. One of the other speakers present was Dr George Carlo. Sharing the same hotel afforded me the opportunity to engage in several conversations with Dr Carlo during the two days we were in London. Dr Carlo

explained how he was commissioned by the mobile industry to conduct research on its products. His study involved 200 research doctors and 15 epidemiological studies, at a cost of 28.5 million US dollars. *"Our data showed increased risk to children, concerning tumours, genetic damage and other problems;"* explained Dr Carlo. He continued; *"my results were suppressed by the telecommunications industry."* (Carlo 2007).

The University of Berne, Switzerland, published a data synthesis of 59 research studies involving possible ill health from low level microwave irradiation. Concluding, the Department of Social and Preventive Medicine stated: *'Studies funded exclusively by industry reported the largest number of outcomes, but were least likely to report a statistically significant result. The interpretation of results.....should take sponsorship into account*". (Huss 2006).

At this time the 'Journal of Industrial Medicine' published its concern over industrial affiliation being concealed by research scientists; suggesting biases from conflicting interests in risk assessments cannot be evaluated properly (Hardell 2006). Examples of these problems from Sweden, the UK and the USA are presented.

Three years later, responsive experimental studies from industrial scientists were still under attack. A virulent editorial was published in 'Microwave News' concluding; *'It's time for industrial scientists to be held to the same standards and suffer the same penalties as they would apply to others. At the very least, those who deceive through scientific misconduct should no longer be able to receive government research grants or sit on advisory and peer review panels.'* (Slesin 2009).

A former Environmental Manager for a mobile industry explained that he had to consider all environmental aspects, save one; whether radiation was harmful to health. He reported that a specially appointed 'expert' would always confirm that radiation was harmless (Hallberg (i) 2009). Hallberg, now an independent scientist, also stated that all truth (unwanted research results) will be ridiculed then violently opposed (Hallberg (ii) op.cit.).

Possibly over concerned emerging adverse publicity, two insurance companies are reported to have included 'exclusion clauses' into their policies with respect to personal damage, mental or physical illness – deterioration – disorder or disability caused or said to be caused by microwave irradiation from the telecommunications industry (Lloyds: Royal: 1998).

Acknowledging the reluctance of some land owners, wishing to rent their land to the mobile industry, the UK Government interceded. Mobile operators were given powers to compulsory purchase land contained within section 118, schedule 4 of the Communications Act of 2003 (Maile 2003).

Concurrently there appears to be two opposing camps. Those who adamantly insist microwaves up to the ICNIRP level are safe and those who maintain there are health issues. This contradiction hinges over the 'Precautionary Principle' and the interpretation of it by either party.

Two spokespersons representing the telecommunications industry wrote: *'No health hazard has been established from exposure to radiofrequency fields up to the levels recommended by the International Commission on Non-Ionizing Radiation Protection. However, in response to public concern and the perceived level of scientific uncertainty there are continuing calls for the application of the precautionary principle to radiofrequency exposures from mobile phones and base stations.*

The precautionary principle is difficult to define and there is no widespread agreement as to how it should be implemented.....' (Dolan 2009)

A response to this statement followed thus:'*.....the precautionary principle is not intended as a response to unfounded fears of the public or to aim at zero risk, but as a risk management strategy in case of scientific uncertainty about the existence or magnitude of risk. Apparently Dolan and Rowley (2009) are not aware that their subjective reasoning does not differ from the unfounded fears and can be summarized as "unfounded reassurance of no harm."*' (Kundi 2009).

Government Regulation

Government Adviser and Consultant Solicitor Alan Meyer produced a document relating to a House of Commons Select Committees' direction to Government scientists. Under statutory legislation, these scientists could only base their guidance and advice on 'conclusive' scientific evidence / proof upon which their 1993 Safety Guidelines remain solely based (Meyer 2000).

As a University qualified experimental physicist, I debated with many other scientists the meaning of 'conclusive proof'. There was universal agreement that 'conclusive proof' would require infinite knowledge. The reason behind this conclusion is that we currently lack understanding of the millions of electrochemical and biochemical processes taking place within our physiological systems; this is before age and gender are considered.

In 2008 (April) the Companies Manslaughter Act came into effect. For the first time, companies / organisations can be found guilty as a result of serious management failures or a 'breach of duty of care'. An interesting argument is: *'if a person died as a result of microwave irradiation from a transmitter, would conclusive proof be required?'* (Health & Safety 2008).

Requiring conclusive proof seems to be in contradiction with Government advice: *'We recommend that a precautionary approach to the use of mobile phone technologies be adopted until much more detailed and scientifically robust information on any health effects becomes available.'* (Mobile Phones and Health (i) 2004). In this same document, the Government Board states; *'it's important to ensure that the exposure of people from all new and existing systems complies with ICNIRP guidelines.'* (p.11 Executive Summary (ii) Sec.57).

This decision to comply with ICNIRP certification was made after it had been downgraded to no more than an information document!

During 'Skelt – v- the First Secretary of State and Three Rivers District Council and Orange PCS Ltd'; an appeal was allowed because it was stated *'.....as the mast conformed to ICNIRP Guidelines, there was no need to consider health concerns.'* Before this case reached the High Court, it was conceded by Government (Skelt 2003). It was argued, ICNIRP certification negates National Planning Guidance 19 para. 53 – 55.

The Precautionary Principle under EU Law, Article 174 of the EU Treaty: states, *'Community policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the community. It shall be based on the precautionary principle and on the principles that preventive action should be taken, that environmental damage should as a priority be rectified at source and that the polluter should pay.'* (Short (ii) 2007).

The European Commission concludes; *'It covers cases where scientific evidence is insufficient, inconclusive or uncertain and preliminary scientific evaluation indicates that there are reasonable grounds for concern that the potentially dangerous effects on the environment, human, animal or*

plant health may be inconsistent with the high level of protection chosen by the EU.' (Short (ii) op.cit.).

The European Parliament, in its Parliamentary Report on *'.....the effects on human health of electromagnetic field'*; (Ries 2008), criticizes the World Health Organization. This document advised the public authorities of 27 member states to *'take measures to provide better protection for the public.'* The author continues *'.....a call for action that contrasts with the status quo favoured by the WHO.....in fact the WHO seems to want to play for time, offering us an appointment in 2015 for a full estimate of the impact of electromagnetic radiation on human beings!'*

The EU Parliament on 4th Sept 2008, by 522 votes to 16, stated that the *'ICNIRP guidelines were obsolete and out of date:'* Source – Mast Action UK – Legal Services. (Mast Action 2010).

Over the past decade I have received many queries from decision makers regarding operator's descriptions of power output. To date my list stands at 13 different units ranging from the single vector of the near field to the decibel (which is a ratio). Coupled with these there are at least seven "assumed assumptions" eg using root mean square instead of peak to peak. The net result is confusion.

Government regulations regarding maximum emissions for a person to receive are almost impossible to regulate: one reason being the combined effect of all transmitters, in a given area interacting together (constructive interference). Alasdair Phillips, Director of Powerwatch, found masts all over the UK that do not comply with planning regulation (Phillips 2002).

A possible consequence of this 'microwave fog' is disruption to the environment. 'Nature' published an article showing how low-level oscillating magnetic fields disrupt the orientation behaviour of migratory birds (Ritz 2004). In 2008 I extended this philosophy, with my lecture for the Glastonbury Festival, referencing similar mechanisms for Producers, First and Second Order Consumers. In fact I could not find an unaffected food web or chain (Trower 2008).

Professor Henshaw in his article, *'So much research, yet so little notice taken'* highlights magnetoreception in plants, animal navigation and other topics. He concludes; *'In my estimation, official review bodies have cited less than 10% of the available scientific evidence relating to ELF-EMF effects. In some areas, none of the literature has been cited'* (Henshaw undated).

The annual monetary value of damaging the Planet's biodiversity is estimated at 33 trillion US dollars. The loss of bees alone in the UK is estimated at 200 million pounds per year (Times 2010).

I have three studies, of which I shall reference one, as they are very similar. These studies relate to the carbon dioxide emissions produced globally by the telecommunications industry. In 2009, it was estimated that their 1% of global energy consumption released 110.7 million tonnes of CO2 into the atmosphere (Bennett 2009).

Since 110.7 million tonnes of CO2 is equivalent to emissions from 29 million cars, I find this a Governmental regulatory paradox. Whilst we are being asked to drive less miles each day, we have an almost unrestricted industry counter balancing our efforts!

In his Editorial to Professor Goldsmith's research paper, Christopher Beaver writes: *'There is not any publicly-supported agency capable of evaluating the accumulated data and recommending and enforcing protective standards. I know whereof I speak'* (Beaver undated).

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