ELECTROPOLLUTION: EXISTENTIAL THREAT TO PUBLIC HEALTH AND LIFE ON EARTH?

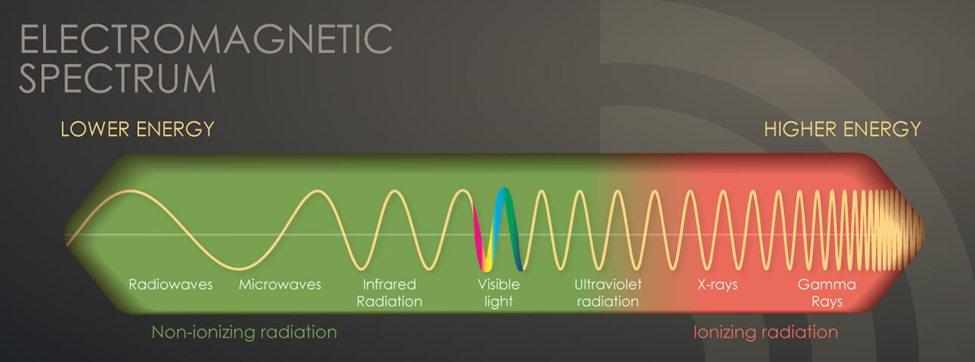
By Michael W. Fox DSc, PhD, BVetMed, MRCVS

“Sensitivity to electromagnetic radiation is the emerging health problem of the 21st century.  It is imperative that health practitioners, governments, schools and parents learn more about it.  The human health stakes are significant. “ ---William Rea, MD, Founder & Director of the Environmental Health Center, Dallas and Past President, American Academy of Environmental Medicine.

“The greatest polluting element in the earth’s environment is the proliferation of electromagnetic fields.” ----EMF pioneer and Nobel prize nominee Dr. Robert Becker

Our planet is a living biosphere (including the atmosphere), what some call the *anima mundi* or soul of the Earth. It sustains all sentient beings whose bioelectrical fields are attuned to the Earth’s electromagnetic field. The planetary biosphere is being covered by the electronic cybersphere, the realm of information technology and electronic communication, especially the Internet. Helping interconnect and socialize humankind, this is seen by some as the “hominizing” techno-evolution envisioned by Fr Pierre Teilhard de Chardin, SJ, facilitating the genesis of the noosphere. the collectively connected evolutionary matrix of human consciousness. (1).

But the nascent global network of 5 G and other telecommunications and associated mega-energy demands of data storage and services, other forms of non-ionizing radiation (NIR) and electromagnetic fields, (EMFs), are harmful at various frequencies and intensities. They are known to affect neuronal function and DNA, may precipitate techno-devolution and degenerative changes in human psychophysiology, health and behavior. (2) They may also decimate insect and other wildlife species and populations, declining biodiversity affecting ecosystem viability and aggravating the consequences of climate change, detrimental to agriculture and public health and the economy. Electromagnetic fields from powerlines, cell phones, cell towers, satellites and wireless impact the birds, bees, wildlife and our environment. (3).



From <https://www.cdc.gov/nceh/radiation/nonionizing_radiation.html>

As we move to the left of the visible light band in the figure above, we move to lower frequencies. By “frequency” we mean how rapidly these waves move up and down. The lower the frequency, the lower the energy.

In these lower frequencies on the left side of the electromagnetic spectrum, we find infrared, microwave, radio waves, and cell phone range radiation. The CDC states “  We don’t know for sure if RF radiation from cell phones can cause health problems years later. The International Agency for Research on Cancer (IARC) has classified RF radiation as a “possible human carcinogen.” <https://www.cdc.gov/nceh/radiation/cell_phones._faq.html>

The Bioinitiative Report 2012 makes the claim that there are significant health risks associated with low frequency non-ionizing electromagnetic radiation[[8]](https://en.wikipedia.org/wiki/Non-ionizing_radiation#cite_note-8)[*"BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (ELF and RF)"*](http://www.bioinitiative.org/)*. www.bioinitiative.org.*.

According to Physicians for Responsible Technology (4) “A diverse array of animal life relies upon the earth’s magnetic field for navigation, breeding, feeding, migration and survival. Biologists have discovered that wireless electromagnetic radiation disturbs internal magneto-receptors used for navigation, as well as disrupting other complex cellular and biologic processes in mammals, birds, fish, insects, trees, plants, seeds and bacteria with profound impacts on the natural environment. Different species have different interactions with radiofrequency radiation (RFR) and differ in their toxic effect. These effects may not be immediately apparent with a slow decline in the health of wildlife seen over time with cumulative exposure.

**Increased Radiofrequency Radiation and The Decline of Birds, Bees and Wildlife**

Biologists have noted that wildlife are susceptible to harm from manmade ambient electromagnetic fields. Researchers are now attributing RFR from cellular telecommunications to be a contributing cause of bee “colony collapse disorder”, insect disappearance, the decline in house sparrows in London, as well as the steady deterioration of the worlds bird population with now than 40% of bird species under critical threat. Scientists note a serious lack of radiation monitoring and protocols to study the impacts and call for precaution in the placement of cell towers and further expansion of wireless broadband. In the United States, Section 704 of the Telecommunications Act of 1996 does not allow consideration of environmental effects in the placement of cell towers. **[Telecommunications Act of 1996](https://transition.fcc.gov/Reports/tcom1996.pdf)**

**The European Commissions Scientific Committee on Health and Environmental Emerging Risks (SCHEER)**  in 2018 issued their[**emerging risks report**](https://ec.europa.eu/health/sites/health/files/scientific_committees/scheer/docs/scheer_s_002.pdf) . They listed 5G electromagnetic radiation as an emerging risk due to it’s effects on wildlife. They pointed to a recent [**article**](https://www.ncbi.nlm.nih.gov/pubmed/29655646) “5G wireless telecommunications expansion: Public health and environmental implications. (2018) by Russell CL in Environmental Research.  Other important research includes Dr. Martin Pall’s articles [5G: Great Risk for EU](https://www.ncbi.nlm.nih.gov/pubmed/29655646)  and [Wi-Fi is an important threat to human health.](https://www.sciencedirect.com/science/article/pii/S0013935118300355)

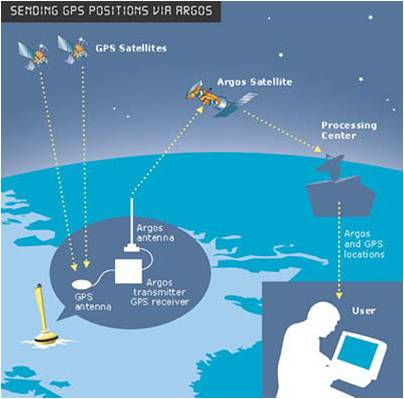
**Wildlife Are More Vulnerable to Wireless Radiation**

Adverse responses from radiofrequency radiation that have been identified include abnormal behavior, developmental abnormalities, diminished reproduction and increased mortality. Birds, bees, turtles, dolphins, salamanders, salmon, amphibians and other animals use the earth’s weak magnetic field and their own internal magneto-receptors to navigate.  Birds have feathers that can act as antenna and amplify the negative effects of RF radiation (5). Insects, the base of the food chain, appear particularly susceptible to radiofrequency radiation, especially 5G millimeter wavelengths which are the size of the insect and create a damaging resonance effect.” Several studies confirm these assertions. ( 6,7, 8).

Mammals, like humans, have similar reproductive organs, immune systems and nervous systems, thus are susceptible to molecular and cellular harm from artificial wireless radiofrequency wavelengths. Katie Singer, in her extensively referenced book *Electronic Silent Spring*, highlights that the Earth’s living systems evolved their own internal and external signaling systems in the presence of the earth’s low electromagnetic environment and thus are vulnerable to the much higher levels of artificial pulsed electromagnetic radiation experienced today. (9)

Combined with habitat loss and pesticides, the demise of insects and insectivores is the new norm of the Anthropocene epoch, the consequences of which will highly detrimental to agricultural productivity, the economy and public health especially with the emergence of resistant species and strains of insect pests and pathogenic vectors of disease.

Already changes in brain function and connectivity are being documented in children with early exposure to cybertechnology, (10) especially addictive computer games, calling for limited daily exposure. People who are electrosensitive to NIR and EMFs are developing often severely incapacitating physical and cognitive difficulties which are generally dismissed by health authorities. Many otherwise healthy adults experience addiction-withdrawal when there are power failures.



**GPS/satellite telemetry process (from Argos 2008:11). The GPS receiver stores location data. This data is later transmitted to the Argos satellite, where it can be distributed to users worldwide.**

Conspiracy theories concerning the rise of wireless technology such as it being part of a global technocracy controlling human behavior abound. They deflect legitimate questioning and public disclosure of documented environmental and public and animal health risks. So does the more legitimate concern over China’s Huawe telecommunications company involvement in 5G and U.S. cybersecurity These risks need to be weighed against the benefits of having smart phones, meters, cities, WiFi, and telemedicine. The environmental costs, including loss of biodiversity (insects notably), contribution to climate change with escalating energy use, and effects on human behavior, anatomy and physiology are considerable. The World Health Organization in 2011 designated such radiofrequency radiation as a probable carcinogen in the same category as lead and DDT. The U.S. National Toxicology Program (NTP) reported cancers in test animals, (11, 12) some similar to those seen in humans, and the incidence of brain tumors in young people is in the rise. (13).

The NTP studies found that high exposure to RFR used by cell phones was associated with:

* **Clear evidence of tumors in the hearts of male rats.**The tumors were malignant schwannomas.
* **Some evidence of tumors in the brains of male rats.**The tumors were malignant gliomas.
* **Some evidence of tumors in the adrenal glands of male rats.**The tumors were benign, malignant, or complex combined pheochromocytoma.

The use of the Internet via smartphones, lap tops and tablets ( users being warned to keep such devices away from various body parts) for mass entertainment, social media, gaming, pornography, market advertising and purchasing, public surveillance, spreading of disinformation and various cybercrimes and failures of cybersecurity systems are all escalating along with various military applications. 5G telecommunication systems are spreading coupled with the expanding smart/cell phone market.

This is not a neo-Luddite overstatement, but a call for sensibility by all users. Limiting daily use and market and consumer- driven content and trivial narcissistic postings would be a start. It is a boon especially for scientists and others monitoring and sharing data about the environment, endangered species and in telemedicine, disease diagnostics, monitoring and prevention, weather forecasts to support farmers and communities.

But the control, promotion and exploitation of the Internet by vested interests, commercial, political and ideological, are now well embedded. This calls for personal vigilance and disengagement apart from highly selective searches and communications germane to what Teilhard de Chardin envisioned as the common good derived from any technology, all of which come with hidden costs, risks and unforeseen consequences. Artificial intelligence in the foreseeable future for analytical purposes and to fact-check and make all internet entries verifiably truthful may be one appropriate application of data mining and analysis. Then the truth will set us free from the bonds of anthropocentric distortions of perception and conception, opening us to the noosphere as we engage with the sentient empathosphere of informed feeling, inspired by and connected with nature, other animals, plants, through greater understanding by way of science, silent contemplation, meditation, poetry and music which move us to compassionate action and humility.

The collective sensorium of this life community which the biosphere and solar radiation help sustain, creates a unifying connectivity of conscious, sentient life, notably this empathosphere at the emotional level of awareness. (14). It would be a great tragedy if anthropogenic electropollution were to disrupt such life-sustaining connectivity. Researchers have found that sweat ducts in human skin acted as “helical antennas,” the ducts acting as receptors for 5G radiation – allowing them to not only capture the radiation, but to concentrate and amplify it. ( 15, 16, 17). In addition, EMF radiation may cause effects at the cellular level, thereby impacting chromosomes, DNA, proteins and genes and the concentration of radiofrequency radiation from sub-terahertz waves in skin can trigger: a sensation of heat and a “sudden, acute pain response.” reported by electrosensitive individuals.(18, 19, 20).

But healthy and empathic human connectivity will be a pipe dream if electropollution and its harmful effects on us and all living beings so far studied by scientists (see *Addendum* of additional reference citations) continue to be denied, and what Pope Francis in his encyclical *Laudato Si’* calls “tyrannical anthropocentrism.”

With the consequences of anthropogenic climate change challenging future generations of our species and of plants, and animals and the planet’s future, all polluting and life-harming technologies need to be curtailed for the common good and the good of the Commons. The life community will have additional survival and adaptation challenges as the Earth’s radiation-protecting electromagnetic field weakens and polar axis shifts and reversals. (21,22). Our planet may also be moving into a “warmer” region of the cosmos with more intense and different forms of radiation. Anthropogenic forms or radiation may confound those of our own biological evolution and adaptive abilities and that of other sentient life forms. Karam notes that cosmic supernovae and gamma ray bursts “have produced radiation levels that, while not lethal, are genetically significant, and these events may have influenced the course of evolution and the manner in which organisms respond to radiation insult.” (23).

It is assuring to have science affirm what Teilhard de Chardin declared:” How great is the mystery of the first cells which were one day animated by the breath of our souls! How impossible to decipher the welding of successive influences in which we are forever incorporated! In each one of us, through matter, the whole history of the world is in part reflected.” (23). As such composite beings of this biosphere we owe it to others, our ancestors, commensals and symbiotes including those within our own bodies, the reverential respect that is long overdue as we re-define ourselves as a planetary species, co-evolved, co-dependent and aware, giving more to life than we take and avoiding harm when and where ever we can. As the Anishinaabe Chippewa assert: *Manaaji’idiwin-*--respect all beings and things.

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POSTCRIPT

ANIMALS WITH ELECTRONIC NECK- COLLAR DEVICES

Users of cell phones, tablets and lap-top computers are advised to keep such devices away from various body parts. Such warnings are predicated by The CDC stating; “We don’t know for sure if RF radiation from cell phones can cause health problems years later. The International Agency for Research on Cancer (IARC) has classified RF radiation as a “possible human carcinogen.” <https://www.cdc.gov/nceh/radiation/cell_phones._faq.html>

In 2011, the [International Agency for Research on Cancer](https://en.wikipedia.org/wiki/International_Agency_for_Research_on_Cancer) (IARC) from the [World Health Organization](https://en.wikipedia.org/wiki/World_Health_Organization) (WHO) released a statement adding radiofrequency electromagnetic fields (including microwave and millimeter waves) to their list of things which are possibly carcinogenic to humans.[[3]](https://en.wikipedia.org/wiki/Non-ionizing_radiation#cite_note-WHO_IARC-3) *IARC (31 May 2011).* [*"IARC Classifies Radiofrequency Electromagnetic Fields As Possibly Carcinogenic To Humans"*](http://www.iarc.fr/en/media-centre/pr/2011/pdfs/pr208_E.pdf) *(PDF). Press Release (Press release).*

This raises the question of the safety for animals wearing radio collar devices, now widely used on various wildlife species for monitoring, research and conservation/management, and increasingly on livestock and companion animals. Global positioning system (GPS) and very high frequency (VHF) radio collar telemetry systems are widely used to provide high spatial and temporal resolution information for detecting wildlife and domestic animal location and movement.

For wildlife the major problems are higher mortalities and morbidity associated with capture stress and the physical and behavioral problems caused by the neck collars. (The National Park Service U.S. Department of the Interior The Natural Resource Program Center, Biological Resource Management Division and The Soundscapes Program Center. A Critique of Wildlife Radio-Tracking and its Use in national parks. A Report to the US National Parks Service by L. David Mech and Shannon M. Barber 2002, <http://npshistory.com/publications/wildlife/radio-tracking-2002.pdf>)

The ethics and animal welfare implications of such devices are considerable. ( See Unlocking the “Virtual cage” of Wildlife surveillance. By Henry Linger and Tom Lininger <https://scholarship.law.duke.edu/cgi/viewcontent.cgi?article=1339&context=delpf>).

Electronic shock and vibration-generating collars have been associated with cancer in dogs by several owners using such devices in association with electric “Invisible Fences” and to stop their dogs from barking. But further research would be helpful in confirming such associations as documented in the *Canine Journal* ( https://www.caninejournal.com/community/do-shock-collars-cause-cancer/Remote electronic training collars have been documented to have adverse welfare consequences to dogs and such stress could play a contributory role in some dogs developing cancer ( See Jonathan J. Cooper, Nina Cracknell, Jessica Hardiman, Hannah Wright, Daniel Mills. The Welfare Consequences and Efficacy of Training Pet Dogs with Remote Electronic Training Collars in Comparison to Reward Based Training. *PLoS ONE*, 2014; 9 (9): e102722 DOI: [10.1371/journal.pone.0102722](http://dx.doi.org/10.1371/journal.pone.0102722)).See also Steiss, J.E., Schaffer, C., Ahmed, H.A., Voith, V.L., 2007, Elevation of plasma cortisone levels and behaviour in dogs wearing bark control collars. Applied Animal Behaviour Science 106: 96-106

So- called invisible, wireless, electric fences widely used to contain dogs on private property have been anecdotally associated with fear/anxiety syndromes, seizures, lymphoma and other cancers in dogs having frequent exposure to such non-ionizing radiation. More research is called for to determine the veracity of such concerns and in other species where such systems of containment are used. (Electric pulse training aids: more evidence needed, says CAWC*Veterinary Record* Vol 171, 257. 2012. http://dx.doi. org/10.1136/vr.e6093).

The American Cancer Society’s posting (Microwaves, Radio Waves, and Other Types of Radiofrequency Radiation, May 31, 2016 ( https://www.cancer.org/cancer/cancer-causes/radiation-exposure.html).and noting that the International Agency for Research on Cancer has identified RF exposure as a possible carcinogen, emphasizes that the U.S. Environmental Protection Agency and the U.S. National Toxicology Program have not yet formally classified RF radiation as to its cancer-causing potential.

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Bottom of Form

**Atmospheric Composition**

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ADDENDUM

EMFS AFFECTING WILDLIFE

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