

When Light Turns to Darkness

Electromagnetic Radiation and Health: Are Our Wireless Technologies Harming Us?

Margot DesBois
3/12/2025

Dedication

In memory of Arthur Firstenberg (May 28, 1950 – February 25, 2025)

I first read Arthur Firstenberg's book *The Invisible Rainbow: A History of Electricity and Life* in 2023. While its detailed and often disturbing information was sometimes difficult for me to take in, the book provided refreshingly clear insights into the mysteries of human health and disease. Firstenberg's descriptions of the illnesses induced by Man's electric technologies resonated with my own experiences, observations, and research. I found the book's explanations and evidence of harm to be compelling. I began exploring the website of Firstenberg's organization, Cellular Phone Task Force, and I signed up for his Substack newsletter. A few months later, my brother and I co-led a small book group discussion on *The Invisible Rainbow*, delving deeper into the contents and their implications. As I learn more about the topic of EMFs and health and make changes in my own use of technology, I keep returning to this groundbreaking book as a resource.

In his writing, Firstenberg had a remarkable ability to synthesize individual pieces of scientific information into coherent analyses, all the while incorporating the complex human experience. His depth of knowledge is evident. Moreover, I feel as though reading his work gave me a glimpse into this man's soul: his perspective on life, his hopes for humankind, his love for Creation. His life was marked with acts of service to humanity. He did what he believed was right without regard for society's standards of success. He seemed to hold a higher standard by which he judged his actions.

Firstenberg suffered debilitating acute and chronic illness in response to our electrified world, but he insisted that his "electrical sensitivity" was not abnormal, but rather universal—simply a condition of being a living organism. He committed his life to raising awareness about the global ravages of electropollution one person at a time and changing public policy from the grassroots level. His steadfast determination and courage to speak the truth in the face of formidable opposition continues to inspire me.

Thank you, Arthur Firstenberg. God bless your soul.

You can read an obituary here:

https://open.substack.com/pub/arthurfirstenberg/p/bearstar?r=sp48x&utm_campaign=post&utm_medium=web&showWelcomeOnShare=false

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My semi-rural New England town is a wonderful place to walk, run, and cycle. Many residents, young and old, including myself, make regular use of the quiet streets and trails for exercise and recreation. On any given day, I may cross paths with several others enjoying these local routes of picturesque natural beauty and abundant wildlife. It has been this way for all of the 19 years I have lived here. But over the past few years, I have noticed a change. My brief greetings to passers-by go unacknowledged more and more frequently. More often than not, I cannot even catch a neighbor's eye as we make way for each other on the sidewalk. It is rare for me to pass a person—adult or adolescent—out and about without white bits of plastic protruding from his ears and a slender rectangular shape pressed against some part of his body. A hunched teenaged boy strokes his thumb across the screen in his hand. A young girl talks to her wristwatch. A toddler in a stroller taps on a glowing tablet. Men and women shut out the world around them as they listen to the voices in their heads or speak animatedly into the air. Each of these people appears hypnotized, oblivious to his surroundings.

The constant attachment to mobile telecommunications devices has become a widespread societal addiction, encompassing virtually every demographic. This phenomenon, and its observable consequences, raise numerous philosophical and practical questions in my mind: Have humans lost the desire to engage with their present reality? Will we soon lose the capacity to do so? Have we already become a thoroughly brainwashed and brain-damaged population, unable to think and function for ourselves? I have chosen to focus here on one particular question that lends itself to concrete answers: How is our use of wireless electronic technologies affecting our health and well-being?

It has become impossible to ignore that our human population is ill. We are experiencing a modern epidemic of chronic disease affecting the majority of children and adults in America and comprising types and degrees of suffering and disability virtually unknown to past generations. Much of this illness is driven by our human-created environment. We have made dramatic changes to our physical environment during the past two centuries, accelerating in the past few decades. These changes involve nearly every aspect of our lives—from what we put into and onto our bodies to how we relate to ourselves, each other, our surroundings, and our Creator.

Our health institutions are beginning to acknowledge how the food, water, air, “medicines,” and consumer products generated by our modern industrial systems (e.g., chemical, agricultural, food, energy, military, pharmaceutical) contribute to our society's state of illness. These material factors (and the ways in which we have brought them into our lives) are important determinants of our health. However, if we focus *only* on the material, we are missing a crucial piece of the picture: not another *substance* to add to the list of toxic exposures, but rather something more fundamental—a *force*; an *energy*.

One key factor frequently neglected or downplayed in discussions about the environmental drivers of illness is *electromagnetic fields (EMFs)*: our ubiquitous and ever-growing exposure to electromagnetic radiation (EMR) from man-made sources ranging from the electric power grid, to cell towers, to satellites, to radar stations, to household electronic appliances, to personal wireless communication devices.

Safe and Necessary?

As a global society, we have collectively bought into the notion that our wireless technologies are both safe and necessary. We assume that the levels of radiation emitting from our smartphones and cell towers are regulated to be integrated safely with living organisms. We are largely unaware that regulators across the world have determined human exposure standards for radiating telecommunications technologies using unrealistic and irrelevant studies.¹ For the past thirty years, the U.S. Food and Drug Administration (FDA) and the Federal Communications Commission (FCC) have based “non-ionizing” radiation exposure limits on a tenuous foundation of a few short-term experiments from the 1970s and ’80s assessing lab animal behavior responses to one form of microwave radiation.² The only safety testing of radiating devices involves measuring energy absorption in fluid-filled mannequins.³ The heating of human tissue is the only biological harm considered.⁴ These same irrational standards have been applied to every new and different wireless technology from 1996 to the present. We do not seem to know or care about this insufficient safety testing. Indeed, we do not even pay attention to the warnings based on these meager regulations that are hidden within the packaging of our devices.

In reality, your wireless device is continuously shooting invisible radiation into your body, your organs, your cells, 24/7. And it is also shooting every person and every living thing around you with this seemingly harmless energy. This radiation immediately immobilizes some people with illness, and it kills or disables others more slowly after some delay of months or years. What if everybody decided to carry such loaded and continuously discharging weapons everywhere they went? What if we installed them in every building, mounted them on rooftops and towers, and launched them into space orbit on satellites to rain radiation down onto the Earth? What if shooting yourself in the head with radiation became “normal,” and even “necessary” to participate in society? What if we even thought it was safe to shoot this radiation into the developing brains of our infants and children? What if such behavior was called “progress”?

¹ Héroux, P., Belyaev, I., Chamberlin, K., Dasdag, S., De Salles, A. A. A., Rodriguez, C. E. F., Hardell, L., Kelley, E., Kesari, K. K., Mallery-Blythe, E., Melnick, R. L., Miller, A. B., Moskowitz, J. M., & on behalf of the International Commission on the Biological Effects of Electromagnetic Fields (ICBE-EMF). 2023. “Cell Phone Radiation Exposure Limits and Engineering Solutions.” *International Journal of Environmental Research and Public Health*. 20(7). 5398. <https://doi.org/10.3390/ijerph20075398>.

² Federal Communications Commission. 2025. “Radio Frequency Safety.” <https://www.fcc.gov/general/radio-frequency-safety-0>; D’Andrea, J. A., Gandhi, O. P., and Lords, J. L. 1977. “Behavioral and thermal effects of microwave radiation at resonant and nonresonant wavelengths.” *Radio Science*. vol. 12, no. 6S. p. 251-256. <https://doi.org/10.1029/RS012i06Sp00251>; de Lorge, J.O. 1983. “The Thermal Basis for Disruption of Operant Behavior by Microwaves in Three Animal Species.” *Microwaves and Thermoregulation*. Academic Press. 379-399. ISBN 9780120440207. <https://doi.org/10.1016/B978-0-12-044020-7.50024-6>; de Lorge, J. O. 1984. “Operant behavior and colonic temperature of Macaca mulatta exposed to radio frequency fields at and above resonant frequencies.” *Bioelectromagnetics*. 5(2). 233–246. <https://doi.org/10.1002/bem.2250050211>.

³ Héroux et al. 2023. “Cell Phone Radiation Exposure Limits.” <https://doi.org/10.3390/ijerph20075398>.

⁴ Héroux et al. 2023. “Cell Phone Radiation Exposure Limits.” <https://doi.org/10.3390/ijerph20075398>.

The Age of Electrification

Electromagnetism is one of the four fundamental forces of nature that form the world as we know it.⁵ As with any intrinsic quality of nature, when humans attempt to control and amplify this force, we create problems. We began harnessing and transmitting electricity on a global scale about 200 years ago with the first telegraph networks.⁶ By the 1890s, power lines and telephone lines entwined the Earth's surface.⁷ In the early 20th century, electricity was freed from wires to penetrate all corners of the earth and sky, ushering in the wireless age of today.⁸ Over decades (and world wars), we advanced radio, television, radar, and satellite networks. Then came personal computers in the 1970s.⁹ At the turn of the millennium, with the expansion of WiFi and shrinking of computer hardware, we started to carry radiating devices with us at all times, wherever we went—in our hands, against our heads, in our pockets, on our laps. We built more antennas covering greater frequency ranges and power outputs—2G, 3G, 4G, 5G, layered upon each other. We have incorporated wireless technologies into our modern systems of business, transportation, medicine, education, and government, with round-the-clock data collection, transmission, storage, and analysis at commercial scales. We did not seem to care that we were substantially altering our planet's electromagnetic envelope (upon which Earth's life depends) and the electromagnetic environment of our cells (upon which our bodies' lives depend).¹⁰ Along with each of these technological revolutions came new waves of acute and chronic disease and ecological destruction.¹¹ Yet we continue to progress from one crisis point to the next, without pause. As much as our current society is determined to ignore it, the EMR from wireless transmitters and receivers on Earth, in the atmosphere, and in outer space that enable our modern telecommunications systems to function is killing ourselves and our planet.

Electricity as the Basis of Life

The evidence of biological harm from electronic technologies has been present from the beginning of their development. Though they have been censored from mainstream channels, a significant number of scientific and medical researchers have been screaming the alarm for decades now (and really, dating back to the first experiments with electricity in the mid-18th century).¹² And since the 1740s, these warnings have largely fallen on deaf ears. These “voices crying in the wilderness” remind us that *humans, like all life forms, are electromagnetic beings*. Our bodies contain an infinitely sophisticated network of subtle electrical communication pathways. All of our cells, tissues, organs, and systems operate through exchanges of electromagnetic energy, carried as charges on ions, and flowing through semi-conducting crystalline structures.¹³ In a sense, electricity is the basis of life. The electromagnetic energy

⁵ Robinson, F. N. H., Kashy, E., and McGrayne, S. B. 2025. “electromagnetism.” *Encyclopedia Britannica*. <https://www.britannica.com/science/electromagnetism>.

⁶ Firstenberg, A. 2020. *The Invisible Rainbow: A History of Electricity and Life*. White River Junction, VT: Chelsea Green Publishing. p. 49.

⁷ Firstenberg. 2020. *Invisible Rainbow*. p. 79.

⁸ Firstenberg. 2020. *Invisible Rainbow*. p. 95.

⁹ Firstenberg. 2020. *Invisible Rainbow*. p. 226, 315.

¹⁰ Firstenberg. 2020. *Invisible Rainbow*. p. 127-129.

¹¹ Firstenberg. 2020. *Invisible Rainbow*. p. 2; p. 130-131.

¹² Firstenberg. 2020. *Invisible Rainbow*. p. 29-42.

¹³ Firstenberg. 2020. *Invisible Rainbow*. p. 140-154.

transmitted by our sun, our atmosphere, and our planet (along with other astronomical entities) forms the global “electrical circuit” that governs the interdependent physical processes of the biosphere and all of its constituents.¹⁴ Life emerged and evolved within this particular energetic environment—it is essential to all living existence. Energy absorbed and transmitted in this environment forms a complex, multilayered language, in which all life forms participate. The living Earth oscillates, vibrates in harmony and resonance. Indigenous cultures throughout the globe have understood this basic truth and expressed it in their own ways for millennia. Ancient and enduring philosophical and religious traditions have described our energetic essence as Qi, Prana, and Vital Energy, among other names.

As I write this now, I wonder: How have we come to forget our energetic essence? Why *wouldn't* we expect ourselves to react to man-made EMFs? The electromagnetic radiation our wireless (and wired) electronic technologies send through the air penetrates and interacts with our bodies, yet it differs from nature’s electromagnetic radiation in several key ways: First and perhaps most importantly, the messages it carries are biological nonsense—that is, the shapes, pulsations, and polarities of our devices’ digital signals, plus their unintended interference, are a language unknown and unintelligible to our cells.¹⁵ These disjointed messages are not only non-information; they are discordant, disruptive, like notes played out of tune in the middle of an orchestral symphony. Unlike our biosphere’s natural microwaves, which come from innumerable directions in disparate phases and polarizations—thus neutralizing each other and producing no electromagnetic fields—Man’s microwaves are produced in synchronization (with the same phase and polarization), generating strong fields, which have detrimental biological effects.¹⁶ These unnaturally shaped, sized, aligned, and pulsed microwaves are present on Earth in unnaturally high amounts thanks to our machinery. It is also worth considering that the power density of artificially sourced EMR is often far greater than in the natural world. (In the case of a typical city, the former exceeds that of natural radiation on the Earth’s surface by a factor of 10^7 in the 300 MHz to 300 GHz frequency range.)¹⁷ However, it may well be the *lower intensity* radiation (which more closely matches the signal strength of nature’s EMR) that causes the greatest damage to organisms.¹⁸

A Grand Deception

Why do so many of us today assume that the EMF-generating technologies we use every day in all facets of life and have chosen to form the basis of society are safe for us and compatible with life? A comprehensive answer can be found by exploring humanity’s present mechanistic

¹⁴ Firstenberg. 2020. *Invisible Rainbow*. p. 114-117.

¹⁵ See: Sage, C. 2015. “The implications of non-linear biological oscillations on human electrophysiology for electrohypersensitivity (EHS) and multiple chemical sensitivity (MCS).” *Reviews on environmental health*, 30(4), 293–303. <https://doi.org/10.1515/reveh-2015-0007>.

¹⁶ Schumann, D. 2018. “Confronting Myths: Natural vs. Artificial EMF.” *Living with Radiation*. <https://www.livingwithradiation.com/confronting-myths-natural-vs-artificial-emf/>.

¹⁷ Warnke, U. 2009. “Bees, Birds and Mankind: Destroying Nature by ‘Electrosmog.’” In: Hecht, K., Kern, M., Richter, K., and Scheiner, H-C., eds. Lüttichau, M., trans. *Effects of Wireless Communication Technologies: A Brochure Series by the Competence Initiative for the Protection of Humanity, Environment and Democracy*. <https://kompetenzinitiative.com/bees-birds-and-mankind/>. p. 11.

¹⁸ Firstenberg, A. 2024. “Power is Irrelevant.” *Arthur Firstenberg*. https://open.substack.com/pub/arthurfirstenberg/p/power-level-is-irrelevant?r=sp48x&utm_campaign=post&utm_medium=web&showWelcomeOnShare=false.

worldview, developed during the Enlightenment, with roots stretching further back in time. A more immediate answer: Because for the past two centuries, we have been trained to ignore our electromagnetic nature. Since we first learned how to capture electrical energy and make it do work for our industry and pleasure, we have turned a blind eye to our own electrical essence. Commercial interests have drowned out the critics—from both the scientific and medical communities and the citizenry. Fraudulent regulatory frameworks have been established and upheld to protect the interests of the utilities and telecommunications industries at the expense of the people’s safety—a familiar pattern today, with the extensive merging of state and corporate power.¹⁹ This issue of money and political power overriding legitimate concern and caution is international in scope. The German publishers of bioscientist Ulrich Warnke’s 2009 informational brochure *Bees, Birds and Mankind: Destroying Nature by ‘Electrosmog’* note:

The involvement of government in industry and the high percentage of industry-financed research and industry-beholden panels and consultants, have spawned a questionable system of environment and consumer protection. Only that which does not seriously endanger common commercial interests is noted and supported. The rights of the citizen to protection and the suffering of the people are flatly ignored. Those with political responsibility have apparently still not realised that their negligent handling of the obligation to take precautions has long since been proven to be one of the main causes of past environmental disasters and scandals.²⁰

In the concluding remarks of his report, *Captured Agency: How the Federal Communications Commission Is Dominated by the Industries It Presumably Regulates*, journalist Norm Alster queries the reader:

Should the Internet have been allowed to develop into an ultra-efficient tool for lifting personal information that includes financial records, health histories and social security numbers? Should wireless communications be blindly promoted even as new clues keep suggesting there may be toxic effects? Should local zoning authorities and American citizens be stripped of the right to protect their own health? Should education be digitized and imposed just because technology companies want to develop a new market and lock in a younger customer base?

All these questions can perhaps be rolled up in one: do we all just play dead for the corporate lobbyists and spinners who promote the unexamined and unregulated application of their products?²¹

Aside from the shameless and relentless promotion and propagandizing by “corporate lobbyists and spinners,” we, the people, so easily become addicted to instant, on-demand, remote connectivity and the convenience mobile communication technologies entail. We have allowed

¹⁹ See Harvard Center for Ethics’ 2015 exposé by investigative journalist Norm Alster: “Captured Agency: How the Federal Communications Commission Is Dominated by the Industries It Presumably Regulates.”

<https://www.ethics.harvard.edu/publications/captured-agency-how-federal-communications-commission-dominated>.

²⁰ Warnke. 2009. “Bees, Birds and Mankind.” <https://kompetenzinitiative.com/bees-birds-and-mankind/>. p. 4.

²¹ Alster. 2015. “Captured Agency.” <https://www.ethics.harvard.edu/publications/captured-agency-how-federal-communications-commission-dominated>.

ourselves to be convinced that this technological “progress” is good for humanity and the natural environment. We are, for the most part, willing accomplices in a grand deception.

The Science

The reality is that this deception, originating from both without and within ourselves, is causing immense suffering and death. Many people have realized this through their own experiences and observations. Moreover, the biological effects of our technologies’ EMR have been studied in laboratory, clinical, and field settings. The extant research on man-made EMF safety reveals serious harms, including both acute symptoms and significant contributions to all of the deadly and debilitating diseases of modern civilization. Thousands of peer-reviewed studies demonstrating mechanisms and types of harm have been published around the world.²² This body of research spans the scientific disciplines of biophysics, biochemistry, cell biology, physiology, plant biology, wildlife biology, neurology, and epidemiology. It includes experimental in-vitro and in-vivo studies and observational studies, with subjects ranging from cells, to plants, to flies, to mice, to birds, to humans.

One crucial and repeated finding: The ability of metabolic enzymes to react with their cofactors and substrates diminishes when they are exposed to external radiation. In other words, the chemical reactions within our cells that break down food to generate energy and new structures depend on the cell’s electromagnetic environment.

One class of compounds particularly sensitive to EMFs is porphyrins, light-sensitive pigments found in all plants, animals, and bacteria. Porphyrins are essential for electron transport in biomolecules such as chlorophyll, hemoglobin, myoglobin, the cytochrome enzymes of the mitochondria, and the myelin sheaths of neurons.²³ Artificially sourced EMR has been demonstrated to interfere with porphyrins’ ability to reduce oxygen, leading to inefficient cellular energy production and metabolism of macronutrients, and the generation of reactive oxygen species and oxidative stress.²⁴ As researcher Arthur Firstenberg summarizes, “Like rain on a campfire, electromagnetic fields douse the flames of metabolism. They reduce the activity of the cytochromes, and there is evidence that they do so in the simplest of all possible ways: by exerting a force that alters the speed of the electrons being transported along the chain of cytochromes to oxygen.”²⁵ As more and more medical researchers are beginning to acknowledge, such metabolic impairment lies at the root of nearly every chronic disease of today. And this is just one of several studied mechanisms of EMFs’ biologic disruption.

Cellular and sub-cellular impairment by man-made EMFs (at exposure levels commonly experienced by industrialized populations) has been shown to cause metabolic dysfunction, immune system impairment, nervous system disruption, cardiovascular changes, endocrine system malfunction, DNA damage, reproductive system harm, eye diseases, skin rashes,

²² See: BioInitiative Working Group. Cindy Sage and David O. Carpenter, eds. 2012. “BioInitiative Report: A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Radiation.” <https://bioinitiative.org/>; resources at the end of this document.

²³ Firstenberg. 2020. *Invisible Rainbow*. p. 133-140.

²⁴ Firstenberg. 2020. *Invisible Rainbow*. p. 181; 187-189; 212-218.

²⁵ Firstenberg. 2020. *Invisible Rainbow*. p. 156.

gastrointestinal disturbances, behavioral changes, and symptoms of headache, fatigue, dizziness, cognitive impairment, focus and concentration difficulties, muscle and joint pain, insomnia, and tinnitus, among others.²⁶ Cumulative exposure leads to chronic illnesses such as heart disease, stroke, cancer, diabetes, and obesity, as well as developmental disorders, anxiety, depression, behavioral disorders, dementia, and infertility.²⁷

Humans are but one of the innumerable creatures disrupted by this electrical onslaught. Species decline and functional and behavioral abnormalities in wildlife, so often attributed to “climate change,” have been observed in response to exposure to man-made EMFs, even at supposedly “low” levels.²⁸ Central and Eastern European forests located in the path of Soviet military telecom and radar stations operating in the 1970s-’80s exhibited damaged trees and vegetation and acidic, dead soil—which experienced regeneration after the stations were shut down in the 1990s.²⁹ Rural communities situated near high powered radio and radar broadcast stations have experienced chronic ill health (documented in people, livestock, and plants), which reversed with the powering off of the antennas.³⁰ It is possible that the recent decline in the vitality of the Amazon rainforest has more to do with the comprehensive radar surveillance system installed in 2002 than with “global warming.”³¹ Communication, metabolic, reproductive, and developmental abnormalities (and mortality) are clearly demonstrated in many insect species subjected to radiation from electronics, and ant and bee colonies respond with immediate and dramatic changes in hive and nest behavior.³² Honeybee “colony collapse disorder” has been linked more strongly to the introduction of long-distance radio communication than to any infectious pathogen.³³ It is well-documented that migratory birds and homing pigeons, which rely on the Earth’s magnetosphere for navigation, have become disoriented and lost with unprecedented frequency following the advent of radio, TV, and cell towers, while urban-dwelling birds suffer reproductive impairments and reduced fitness when nesting near radiating antennas.³⁴ Ironically, biologists concerned with the increased death and disappearance of so many wild species have elected to tag animals, from bees to whales, with radiofrequency

²⁶ See: “BioInitiative Report.” 2012. <https://bioinitiative.org/>; resources at the end of this document.

²⁷ See: Firstenberg. 2020. *Invisible Rainbow*; resources at the end of this document.

²⁸ See: Levitt, B., Lai, H. & Manville, A. 2022. “Effects of non-ionizing electromagnetic fields on flora and fauna, part 1. Rising ambient EMF levels in the environment.” *Reviews on Environmental Health*, 37(1), 81-122. <https://doi.org/10.1515/reveh-2021-0026>; Levitt, B., Lai, H. & Manville, A. 2022. “Effects of non-ionizing electromagnetic fields on flora and fauna, Part 2 impacts: how species interact with natural and man-made EMF.” *Reviews on Environmental Health*, 37(3), 327-406. <https://doi.org/10.1515/reveh-2021-0050>; Levitt, B., Lai, H. & Manville, A. 2022. “Effects of non-ionizing electromagnetic fields on flora and fauna, Part 3. Exposure standards, public policy, laws, and future directions.” *Reviews on Environmental Health*, 37(4), 531-558. <https://doi.org/10.1515/reveh-2021-0083>.

²⁹ Firstenberg. 2020. *Invisible Rainbow*. p. 350-354. See also: Schütt, P. and Cowling, E. B. 1985. “Waldsterben, A General Decline of Forests in Central Europe: Symptoms, Development and Possible Causes.” *Plant Disease* 69(7): 548-558. <https://doi.org/10.1094/PD-69-548>; Volkrodt, W. 1989. “Electromagnetic Pollution of the Environment.” In: Krieps, R., ed. *Environment and Health: A Holistic Approach*. Aldershot, UK: Avebury. ISBN: 0-566-07050-2. p. 71-76.

³⁰ Firstenberg. 2020. *Invisible Rainbow*: see examples of Skruda, Latvia (p. 354-356), Konstantynów, Poland (p. 356-359), and Schwanzenberg, Switzerland (p. 359-361).

³¹ Firstenberg. 2020. *Invisible Rainbow*. p. 363-364.

³² Firstenberg. 2020. *Invisible Rainbow*. p. 337-341.

³³ Firstenberg. 2020. *Invisible Rainbow*. p. 341-350.

³⁴ Firstenberg. 2020. *Invisible Rainbow*. p. 324-335; See also: work of wildlife biologist Alfonso Balmori, here: <https://cellphonetaskforce.org/the-work-of-alfonso-balmori/>.

transmitting tracking antennas, rather than acknowledge the role that such human technologies may play in these losses.³⁵ In the introduction to his informational brochure Warnke helps us connect the dots and see the pattern:

... if bees and other insects disappear, if birds are no longer present in their traditional territories and humans suffer from inexplicable functional deficiencies, then each on its own may appear puzzling at first. The apparently unrelated and puzzling phenomena actually have a common trigger, however. Man-made technology created magnetic, electrical and electromagnetic transmitters which fundamentally changed the natural electromagnetic energies and forces on earth's surface – radically changing million-year-old pivotal controlling factors in biological evolution.³⁶

In the brochure's preamble, the editors state:

It is clear from his paper that the powers that be in politics, the economy and science are in the process of destroying what nature has built up over millions of years. The traces of this destruction have long been evident in our living environment. The paper shows, however, how short-sightedly we are treating not only our health and the economy, but especially also future generations' right to life. All of the above is documented not as probabilities but based on reproducible effects. This should give pause also to those who regularly justify their actions with the argument that they are unaware of any proof of damage.³⁷

Indeed, we are crippling and exterminating ourselves and our fellow creatures. And, given our society's unrelenting push to develop and deploy new electronic tech for every aspect of life (such as the Internet of Things, Internet of Bodies, Smart Grid, and Smart Cities, all run by "artificial intelligence") this global problem of electro-pollution is only worsening. It will continue on this trajectory and cause increasing destruction of human life and *all* life if we do not begin to recognize and mitigate it.

Captured Minds and Souls

Perhaps equally important (and equally disregarded) are these technologies' *mental* and *spiritual* harms. Take one of the most ubiquitous technologies of the wireless age: the smartphone, used by billions of people globally and operated by a network of millions of tower base stations. This device is the most powerful tool of enslavement yet created. Its effectiveness at circulating controlled narratives in words and imagery, suppressing original thought and creativity, and shaping perceptions and behaviors, is unrivaled. When we turn on the little screen, we readily succumb to the device's addictiveness, which is facilitated both by algorithms and pulsed radiation. Once it has us in its thrall, the smartphone captures our minds and bodies through mass propaganda dissemination, surveillance, and diminishment of all experience—no matter what apps you use on it or how you use them. In each use of this technology, human engagement is devalued, language is fragmented, and communication is inhibited. In other

³⁵ Firstenberg. 2020. *Invisible Rainbow*. p. 331-334.

³⁶ Warnke. 2009. "Bees, Birds and Mankind." <https://kompetenzinitiative.com/bees-birds-and-mankind/>. p. 6.

³⁷ Warnke. 2009. "Bees, Birds and Mankind." <https://kompetenzinitiative.com/bees-birds-and-mankind/>. p. 4.

words, “the medium is the message.” When we engage with the device, we lose touch with reality. When we become habitually dependent on virtual experiences and relationships, we begin to forget reality entirely. This separation presents a danger not only to our physical bodies, but also to our souls.

Taking Action: If Not Now, When?

In my view, the first and most critical step towards improving the situation is for *individuals* to reduce their own use of these damaging technologies, by free choice. After all, how can we hope to change society’s behavior if we are not willing to change our own?

Here is a personal example: Along my own journey managing and healing from chronic illness, I have become aware that I am highly reactive not only to many synthetic and natural chemicals, but also to man-made EMF pollution. I cannot spend time in environments with technologies radiating cell signals, WiFi, Bluetooth, etc. without experiencing debilitating, sometimes incapacitating, symptoms (including head pain, brain fog, cognitive processing difficulties, dizziness, vertigo, muscle and joint pain, weakness, exhaustion, tremors, heart palpitations, shortness of breath, nausea, and full body inflammation), as well as exacerbation of existing autoimmune disease, that require hours, days, or weeks of recovery time and effort.

Over the past several years, my parents, my three adult siblings, and I have made our home a reduced-EMF refuge, with all wired internet, TV, and phone connections, no wireless appliances, and reduced electric and magnetic fields in living and sleeping spaces. Five of us do not use smartphones or cell phones. Fortunately, we live in a house that is separated from neighbors’ WiFi, and not too near powerful antennas or power stations. We still have more to learn and more we can adjust, but the changes we have made so far have helped us all regain and maintain health. Really, I am just one of the canaries in the coal mine—a warning to those who are not yet explicitly aware of their danger. This EMF pollution is adversely affecting *everybody*, and it seems that more and more people are reaching their saturation threshold at which physiological dysfunction becomes undeniably manifest.

Look around you: Compared to even a few decades ago (before the advent of cell phones and WiFi), do you see more and more ill people at younger and younger ages? Do you hear about relatives, friends, and acquaintances suffering from “inexplicable” ailments? More normalization of autism, ADD, allergies, anxiety, depression, obesity, and physical disability in children; or of heart disease, diabetes, cancer, chronic pain, cognitive impairment, and dementia in the middle-aged? Of course, other man-made toxicants are contributing to this documented and apparent increase in acute and chronic illness, including a disturbing surge among young people following the COVID-19 “vaccine” rollout and mandates.³⁸ But the EMR so many

³⁸ See: Palmer, M., ed. 2023. *mRNA Vaccine Toxicity*. Doctors for Covid Ethics. <https://doctors4covidethics.org/mrna-vaccine-toxicity/>; Beatie, K. A. 2022. “750+ Studies About the Dangers of the COVID-19 Injections.” <https://doctors4covidethics.org/750-studies-about-the-dangers-of-the-covid-19-injections/>; McCullough, P., et al. 2025. “Courageous Discourse.” <https://petermcculloughmd.substack.com/>; Rancourt, D. G., Hickey, J., Linard, C. 2024. “Spatiotemporal variation of excess all-cause mortality in the world (125 countries) during the Covid period 2020-2023 regarding socio economic factors and public-health and medical interventions.” *Correlation Research in the Public Interest*, Report. <https://correlation-canada.org/covid-excess-mortality-125-countries>.

people encounter every day from cell phones, computers, WiFi antennas, cell towers, base stations, and satellites—some of which have been advanced and intensified in concurrence with the COVID-19 “pandemic”—has surely facilitated the cardiovascular, respiratory, neurological, reproductive, and immune system dysfunction that has become increasingly prevalent just these past few years. The evidence amassed over decades leaves no doubt that artificially sourced EMR triggers and exacerbates these symptoms and conditions exhibited by countless people worldwide in this age of electrification.

My family uses electricity in numerous aspects of daily household life, from lighting, to heating, to refrigeration, to cooking, to laundry. We have not eschewed a modern industrialized way of living. However, we have discovered that our daily life is not only manageable, but *enriched* by using only *wired* electronic technologies, and trying to use them judiciously. By making this choice, we reduce our exposure to both the radiation and the mind control and demoralization generated by using mobile internet and communications devices. We are better able to engage with the present—to attend to the here and now. We can use the internet throughout the house using ethernet connections from our router to our personal computers. We can easily (tele)communicate from home using email or landline telephone. And when we leave our devices tethered to their wires, we can more readily exchange this virtual connectivity for communion with life around us. We see without screens in front of our faces. We hear without ear buds in our ears. We feast on what nature offers our senses, absorbing into all of our cells the Earth’s natural fields and frequencies that sustain us. Our relationships with other people and with all Creation deepen. We participate more fully in life and can more clearly discern the meaning and purpose of our lives. We have found this to be healing for body, mind, and soul.

What about you? I invite you to consider the role electronic technologies play in *your* health. If you became aware of the handheld weapon you wield and the devastation it causes your body and all of life around you, would you continue to use it? I encourage you to learn for yourself, approaching your research with an open and critical mind. At every moment, each of us has an opportunity to choose truth over falsehood, life over death. Let us take this moment to remember what we truly are: energetic beings created by the God who brought light and life into the world. Let us choose to dwell in His light and *live*.

I am the light of the world: he that followeth me shall not walk in darkness, but shall have the light of life.

John 8:12, The Holy Bible, King James Version

“The only thing we can really do for the Earth is to stop destroying it. Then the Earth will take care of itself. Instead of trying to fix the whole planet, let us attend to our own simple lives.”

Arthur Firstenberg, 1950-2025

Margot DesBois grew up and currently lives in northeastern Massachusetts. She graduated from Middlebury College, Vermont, in 2019 with a B.A. in Biology and completion of pre-medical coursework. Margot is particularly interested in the nutritional and environmental factors that influence health and in balancing the energetic and biochemical processes within the body's cells. She believes in the body's infinite capacity to heal with the correct support, and she seeks to continue training in healing traditions that address fundamental causes of disease by supporting fundamental body functions. Since 2010, she has used individualized nutritional therapies under professional direction to treat and manage her own chronic infectious disease and autoimmune complications. Margot co-founded and co-runs a private academic tutoring and educational enrichment service with her three brothers (desboistutoring.org). In 2022, Margot joined the non-profit organization Children's Health Defense as a member of the inaugural class of CHD Fellows. She worked on CHD's Science Team for two years (January 2022 through December 2023), contributing to CHD's mission of exposing the underlying causes of the childhood chronic illness epidemic by researching, writing, and editing scientific content for various projects.

Some Useful Resources:

- Firstenberg, Arthur. 2020. *The Invisible Rainbow: A History of Electricity and Life*. White River Junction, VT: Chelsea Green Publishing.
(<https://www.chelseagreen.com/product/the-invisible-rainbow/>)
- Cellular Phone Task Force: <https://www.cellphonetaskforce.org/>
- American Academy of Environmental Medicine:
<https://www.aeemonline.org/electromagnetic-and-radiofrequency-fields-effect-on-human-health/>; <https://www.aeemonline.org/recommendations-regarding-electromagnetic-radiofrequency-exposure/>; <https://www.aeemonline.org/wireless-radiofrequency-radiation-schools/>
- Children's Health Defense, Electromagnetic Radiation & Wireless:
<https://childrenshealthdefense.org/electromagnetic-radiation-wireless/>
- BioInitiative Report: <https://bioinitiative.org/conclusions/>
- Environmental Health Trust: <https://ehtrust.org/>
- Microwave News: <https://www.microwavenews.com/>
- Building Biology Institute: <https://buildingbiologyinstitute.org/free-articles/1969-2/>
- Massachusetts for Safe Technology: <https://www.ma4safetech.org/>
- Physicians for Safe Technology: <https://mdsafetech.org/>
- EMF Safety Network: <http://emfsafetynetwork.org/safety-precautions/>
- EMF Analysis (Jeromy Johnson): <https://www.emfanalysis.com/>

Some Electromagnetism Terms and Definitions:

Alternating current (AC) – a type of electrical current that reverses its direction at regularly recurring frequency intervals (typically 50 or 60 cycles per second, or hertz (Hz)); generated by power plants and can be easily transformed to different voltage levels for efficient transmission over long distances; commonly used for power transmission and distribution in electrical systems, including in most household appliances and electrical devices

Amplitude – the distance between a wave's equilibrium/resting position and its maximum displacement

Antenna – a device used to transmit and receive electromagnetic waves, such as radio waves and microwaves; commonly used in communication systems, including radios, televisions, and cell phones, to send and receive signals; converts electrical signals into electromagnetic waves for transmission or vice versa for reception

Charge – the attribute of matter by which it responds to electromagnetic forces responsible for all electrical phenomena, existing in two forms to which the signs negative and positive are arbitrarily assigned

Circuit – the course along which an electric current flows

Conductor – a material in which electrons are held loosely by their atoms and thus move more freely; a substance, body, or system that conducts electricity and/or heat

Current – the movement of electric charge through a conductor; measured in amperes (A); dependent on voltage and material; flows from region of negative charge to region of positive charge

Direct current (DC) – a type of electrical current that flows in one direction; commonly used in batteries, electronic devices, and power transmission systems; Unlike alternating current (AC), DC maintains a steady flow of current.

Electric field – an electric property associated with each point in space when charge is present in any form; The magnitude and direction of the electric field are expressed by the value of E , called electric field strength or electric field intensity or simply the electric field.

Electricity – a phenomenon associated with stationary or moving electric charges (carried by electrons)

Electromagnetism – the science of charge and of the forces and fields associated with charge

Electromagnetic field – the physical field produced by moving electrical charges; consists of an electric field and a magnetic field; can be described as a wave transporting electromagnetic energy

Electromagnetic force – a fundamental force of nature; acts between charged particles; binds atomic nucleus and electrons to form atoms; carried by electromagnetic fields; generates electromagnetic radiation

Electromagnetic radiation – a combination of oscillating electric and magnetic fields; travels through space and matter; interpreted alternatively as a wave motion or as a stream of photons (particles)

Electromagnetic spectrum – the complete range of electromagnetic wave radiation on a continuous distribution from the lowest range of frequencies and energy levels, with correspondingly long wavelengths, to the highest range of frequencies and energy levels, with correspondingly short wavelengths; includes radio waves, microwaves, infrared, visible light, ultraviolet, x-rays, and gamma rays

Electromagnetic wave – a transverse wave (wave that oscillates perpendicularly to the direction of its propagation) with electric and magnetic fields that emanate from it; The directions of these fields are perpendicular to one another, and both are perpendicular to the wave's line of propagation.

Electromotive force – a source of energy that can cause a current to flow in an electrical circuit

Electrostatic force – the forces between electric charges; two charges of the same sign will repel, while charges of opposite signs attract

Field – a region of space in which it is possible to define the physical properties of each point in the region at any given moment in time

Frequency – the regularity with which something happens; often applied to a wave or vibration; the number of times a wave's complete cycle of oscillation occurs per unit time; measured in hertz (Hz), or cycles per second

Fundamental frequency – the lowest frequency produced by any vibrating object that displays a periodic waveform

Harmonic – a single wave oscillation whose frequency is an integral multiple of the fundamental frequency

Intensity – the rate at which a wave moves energy per unit of cross-sectional area; often measured in Watts per square meter (W/m^2)

Ionizing radiation – radiation that transfers energy by removing electrons from atoms to generate ions; makes molecules unstable and reactive; part of the high energy range of the electromagnetic spectrum (e.g., x-rays, gamma rays); sources include nuclear reactions and radioactive decay

Magnetic field – the vector field around a magnet's poles, an electric current, or a changing electric field (i.e., moving charged particles)

Magnetism – phenomenon associated with magnetic fields, which arise from the motion of electric charges; field lines form a circular arrangement around a wire carrying an electric current

Modulation – the process of imposing an input signal (a wave carrying speech or data information) onto a carrier wave; changes the amplitude, frequency, or phase of a carrier wave to encode the speech or data information

Period – the amount of time required for a wave to complete one cycle of oscillation

Photon – a particle or packet of electromagnetic radiation (e.g., light) carrying a specific amount of energy, measured in electron volts (eV)

Radiation – the transfer of energy by means of electromagnetic waves, which require no physical medium (e.g., water, air) for the transfer; Earth receives the sun's energy, via the electromagnetic spectrum, by means of radiation.

Resistance – the extent to which a material opposes the flow of electric current; measured in ohms (Ω)

Satellite – a celestial body (natural or man-made) that orbits a larger body; an object that is launched into space and orbits around the Earth or other celestial bodies; used for various purposes, including communication, navigation, weather monitoring, scientific research, and surveillance; equipped with antennas, sensors, cameras, and transmitters to perform its specific functions

Semiconductor – a material in which the electrons are held loosely to their atoms; only a small input of energy is required to free the electrons and therefore make the material conductive; also: a device, such as a transistor or integrated circuit, that depends on the properties of such a substance

Visible light – the portion of the electromagnetic spectrum that the human eye can perceive; wavelengths range from about 400 nm (violet) to 800 nm (red)

Voltage – a measure of the strength of the electrostatic force on particles with electric charge; the potential difference between two points on a conductor; measured in volts (V); determines current

Wave motion – a type of harmonic motion (repeated movement of a particle about a position of equilibrium) that carries energy from one place to another without moving any matter

Wavelength – the distance between two points of the same phase in consecutive cycles of a wave

Electromagnetism Units

Unit Name	Symbol	Equivalent Units	Measure
ampere	A		current
coulomb	C	A*s	electric charge
farad	F	C/V	capacitance
gauss	G	10^{-4} T	magnetic induction/magnetic flux density
henry	H	Wb/A	inductance
hertz	Hz	cycles/s	frequency
joule	J	N*m or W*s	energy
kilogram	kg		mass
meter	m		length/distance
newton	N	kg*(m/s ²)	force
ohm	Ω	V/A	electrical resistance/impedance
second	s		time
siemens	S	A/V or 1/ Ω	conductance
tesla	T	Wb/m ²	magnetic induction/magnetic flux density
volt	V	W/A	voltage (electric potential difference)
watt	W	J/s or V*A	power
weber	Wb	V*s	magnetic flux

Metric Unit Prefixes

Prefix	Symbol	Decimal	Exponential	Short Scale Name
tera	T	1 000 000 000 000	10^{12}	trillion
giga	G	1 000 000 000	10^9	billion
mega	M	1 000 000	10^6	million
kilo	k	1 000	10^3	thousand
milli	m	0. 001	10^{-3}	thousandth
micro	μ	0. 000 001	10^{-6}	millionth
nano	n	0. 000 000 001	10^{-9}	billionth
pico	p	0. 000 000 000 001	10^{-12}	trillionth