SHOULD THE INTERNET REALLY BE EVERYTHING?

What's Not So Smart About Our Smart-Tech Future

We are losing our humanity. We are becoming a data point. Computers are certainly useful. However, research is showing us how important it is to our society to have a healthy connection with nature, and with each other...

Alison Main

Imagine this: Your espresso machine is running low on your favorite fair-trade organic beans, so there's a 1-pound bag added to your Whole Foods shopping cart. Your post-workout blood pressure is higher than last month's average—ergo, you got a personal training session scheduled for tonight at the gym. Your nontoxic laundry detergent is at its halfway mark; no worries, Amazon.com is delivering a new one—arriving today.

You don't consciously know about any of these errands, but your personal AI (artificial intelligence) assistant does. It's "her" job. Or "his." Depending on the anthropomorphic-voice setting you selected.

The Internet of Things (IoT), often referred to as IoE (or the Internet of Everything), is considered the intelligent connection of people, processes, data, and things. And making this connection happen is 5G—the fifth generation of wireless connectivity, operating on millimeter-wave radio frequencies never before accessible to the public, nor tested for long-term safety. Together, IoT and 5G merge humans and tech. And it's where our entire world is moving. Fast.

With telecom and tech companies already rolling out their "smart world" innovative products, our near future will see machine-to-machine and machine-to-human communication explode, from wireless diapers to skin sensors. Touted to make our lives easier, faster, and more comfortable, this omnipresent and omnipotent technology will manage our lives, homes, careers, health, and relationships—all without our deliberate thoughts or actions.

The concept of a networked existence sounds Space Age cool. But the question is: What will this new wave of hyper-connected tech and frequencies do to our bodies, brains, and ecosystem?

THE WORLD'S WIDEST WEB

Practically eviscerating latency, 5G wireless technology will employ higher frequencies to enable these faster data-transfer rates. Because our attention spans have plummeted, we can no longer wait a split second for our email to load, let alone pause for our phone to notify our driverless car to preheat our seats. Specifically, 5G technology will operate using millimeter waves, or extremely high-frequency electromagnetic radiations in the 30 to 300 GHz range, from 1 to 10 millimeter in terms of wavelength.[1]

These frequencies are only useful for short distances, and do not travel through solid materials (like buildings) as readily as our erstwhile 2G, 3G, and (current) 4G frequencies. Consequently, 5G's massive infrastructure necessitates the deployment of several thousands of small-cell antennas, to be placed on lampposts, power lines, water towers, and other public utility structures—more specifically: everywhere. Dr. David O. Carpenter—M.D. and director of the Institute for Health and the Environment at the University at Albany—says: "My major concern is these small-cell antennas are going to be placed in front of every fifth house, and they'll be operating continuously. Which is to say, everybody is going to be living by a cell tower."

Millimeter-wave radiation is considered non-ionizing because the photon energy is not sufficient to remove an electron from its atomic orbit.[1] But therein lies the rub. Current standards of the FCC and ICNIRP (International Commission on Non-Ionizing Radiation Protection)—that is, standards that have not been revised since 1996—are designed solely to protect against thermal (heating) effects. And since millimeter-wave frequencies are tested only for thermal effects (and not for biological ones), public exposure is not deemed hazardous. This, however, is an incorrect paradigm, cunningly designed to serve industry interests and their profits.

For decades, biomedical researchers around the world have been linking non-ionizing, non-thermal radiofrequency with adverse health and environmental effects. Even dating back to 1971, a report out of the Naval Medical Research Institute documented over 2,000 references on the biological responses to radiofrequency and microwave radiation. Compiled over five decades ago, these biological effects include: central–nervous system effects, autonomic–nervous system effects, blood disorders, vascular disorders, metabolic disorders, gastrointestinal disorders, endocrine-gland changes, enzyme and other biochemical changes, and more.[2]

And here's something else to give us pause: Millimeter waves have been used by the U.S. Department of Defense in their Non-Lethal Weapons Program as a method of crowd control, perimeter security, and patrol protections. While used at a higher power density than those projected for our 5G wireless network, these Active Denial Systems nonetheless operate in the millimeter-wave frequency, and are described as an advanced, long-range, non-lethal, directed-energy, counter-personnel capability, which can be projected as a man-size (5-foot) beam of millimeter waves at a range exceeding 3,000 feet.[3] People exposed to these high-power 94-GHz radiations experience a sudden increase in their superficial temperature, resulting in a quick-burning sensation and an escape reaction from the millimeter-wave beam.[1]

Essentially, beam this millimeter frequency at a crowd, and people flee. How's that for a biological effect? But what happens if there is no detectable rise in skin temperature, and the effects are unfelt? Could there still be a biologic response and reaction? Only time and research will tell.

A team of physicists at the Hebrew University in Jerusalem, Israel, recently published a scientific paper on the interaction of this sub-TeraHertz band with human tissue (specifically, measuring the rates at which energy is absorbed by the human body when exposed to radiofrequency). They discovered that in the millimeter and submillimeter frequencies in the sub-THz band, the coiled portion of the human sweat duct in the upper skin layer can act as a helical antenna.

The wavelength set to be used in our new communications systems will be on par with the typical layer dimensions of human skin and other tissues. This could lead to preferential layer absorption in these same tissues of wireless signals under the 5G technology.[4] Of course, further research is needed to determine the long-term health effects of using a frequency that interacts with the human skin in this manner.

DID YOU KNOW...

PRIVACY: Last July, the FBI issued a Consumer Notice warning: "Internet-connected toys could present privacy and contact concerns for children."

LOCAL RIGHTS: Many states have already passed (or are in the process of passing) legislation intended to expedite 5G infrastructure and preempt local zoning rights for the placement of 5G small-cells. New York and Connecticut stand alone with bills that support local zoning rights.

CYBER SECURITY: According to a 2017 survey conducted by Ponemon Institute, 94% of IT risk-management professionals felt it was "very likely," "somewhat likely," or "likely" that an attack from an unsecured IoT device or application could be "catastrophic."

E-WASTE: In 2014, the United States threw out about 130,000 computers every day, and over 100 million cellphones per year. Our planet will be forced to absorb increasing amounts of e-waste as increasingly every "thing"—appliance, device, robot, and sensor—joins the ranks of e-waste.

CONFLICT MINERALS: 5 to 6 million Congolese people have died as a result of our reliance on conflict minerals in the production of all of our digital technology.

HUMANITY: Neurolink is an effort spearheaded by Elon Musk to merge the human brain with AI by creating "enhancement" devices that can be implanted in humans to "keep pace with advancements in artificial intelligence."

JOB LOSS: Robots and the IoT are set to displace millions of workers.

ENERGY WASTE: Data centers that house exponentially increasing amounts of data currently account for about 3% of our world's energy consumption.

WILDLIFE: Wireless technology also harms wildlife, bees, and other pollinators.

ETHICAL ISSUES: Discussion is underway for new Human Rights in the digital age. Among those being considered is "the right to remain natural, i.e., 'merely' biological and organic," and the "right to be inefficient if, when, and where it defines our basic humanness."

FIBER OPTICS: Fiber is a safe, reliable, fast, and far more cyber-secure option than wireless technology, and can be used for the vast majority of our Internet and communications needs—and we've already paid for developing it!

Source: WhatIs5g.info

FULL SPEED AHEAD

In a 2016 talk to the National Press Club last June, Tom Wheeler, former chairman of the FCC, stated: "5G will connect the Internet of Everything. If something can be connected, it will be connected in a 5G world." Disregarding the biological and ecological consequences of unlocking these new artificial frequencies, Wheeler maintained, "technology should drive the policy, rather than the policy drive the technology."

But given the mounting evidence of radiofrequency harm, an international consortium of public health officials, scientists, and concerned citizens is calling for a moratorium on the rollout of 5G, until further research is carried out. And yet, Wheeler's speech made it clear, "Turning innovators loose is far preferable to expecting committees and regulators to define the future."[5]

In the United States, the FCC authorizes or licenses most radiofrequency telecommunications services, facilities, and devices used by the public, industry, and state and local governmental organizations. In *Captured Agency: How the Federal Communications Commission is Dominated by the Industries It Presumably Regulates*, Norm Alster writes: "Captured agencies are essentially controlled by the industries they are supposed to regulate. A detailed look at FCC actions—and non-actions—shows that over the years the FCC has granted the wireless industry pretty much what it has wanted." As a result, "The wireless industry has been allowed to grow unchecked and virtually unregulated, with fundamental questions on public-health impact routinely ignored."[6]

Section 704 of the Telecommunications Act of 1996 preempts state and local government regulation for the placement, construction, and modification of personal wireless service facilities on the basis of environmental and health effects. To make matters worse, the 2012 Spectrum Act strips the city officials and local governments of the ability to regulate cellular-communications equipment while explicitly denying the public any opportunity for input.

Which means that you, the homeowner, have no right to block the installation of a small-cell tower on the lamppost mere feet from your doorsteps; nor does your town council have the authority to shut down localized installation. One day, you may very well wake up to a 5G small-cell transmitter, right outside your bedroom window. And as of today, there's nothing you can do to stop that.

PRECAUTIONARY, NOT REACTIONARY

What about the actual health effects? Dr. Cindy Russell, of Physicians for Safe Technology, explains: "The millimeter waves used in the next-generation of high-speed wireless technologies have shallow penetration and can thus affect the skin surface, the surface of the eye, and the testes which are not protected. It can also have effects on bacteria, plants, and small life forms. Surface effects, however, can be quite substantial on an organism as older studies show that non-thermal stimulation of skin receptors can affect nerve signaling causing a whole-body response with physiological effects on heart rate, heart rhythm, and the immune system." Other primary concerns include disturbed DNA-protein interactions, bacterial effects, antibiotic resistance, cataracts, chromatin effects, and gene expression.[7]

With millimeter waves, the energy is very locally absorbed by the body surface, which generates significantly higher specific absorption rates (that is, rates at which energy is absorbed by the human body when exposed to a radiofrequency) compared to those obtained at lower microwave frequencies for identical power densities.[1] Temperature elevation causes several effects at the cellular level, including cell growth, cell morphology, and cell metabolism. Temperature rise can also induce the production of reactive oxygen species and increase DNA, lipid, and protein damages.[1]

Since millimeter waves have never been used in consumer communications systems, the question remains: Where is the threshold (in terms of power, frequency, and duration) between safe and hazardous exposures?

Carpenter, director at IHEUA, says: "I don't want to go back to the Stone Age. But we should not roll out new technology until we have clear evidence that the technology is not harmful to humans. And the current problem is we have an industry that's in total denial of the enormous body of scientific research which proves radiofrequency exposure

IoT IN ACTION

For most people, the concept of IoT is as nebulous as "the cloud" itself. Here are a few very real examples of IoT in our world today.

NEST SMART THERMOSTAT

Nest learns your family's routines and automatically adjusts the temperature based on when you're home or away, awake or asleep, hot or cold—all in the name of making your house more energy efficient. The mobile app allows you to edit schedules, change the temperature when you're away from home, and receive alerts if something's wrong with your heating and cooling system.

AUGUST SMART LOCK

This smart lock automatically unlocks when you get home, and locks behind you when you close the door. You can grant guest keys to friends, and have them expire when you no longer want that person to have access. An optional keypad means you can set a code to open your door in case you don't have your phone with you. You can view the activity log and grant access from your smartphone remotely.

KOLIBREE SMART TOOTHBRUSH

Kolibree connects to your smartphone and encourages good brushing habits for both kids and adults, saving data on your phone about your brushing habits.

PETNET SMART PET FEEDER

Petnet's smart feeder calculates the best type of food for your dog or cat, computes how much they should be eating, and sets up pet-food deliveries for when you run out. You can control the smart feeder via your smartphone, and you can monitor your pet's food consumption when you're away from home.

OCEANIT LABORATORIES SMART CEMENT

Oceanit Laboratories (along with other research companies) embeds nanosensors in their cement material, allowing it to "[behave] more like a sensor, capable of transmitting and responding to mechanical, acoustic, and magnetic signals." They give the example of oil drilling: The cement surrounding a well could pass information back to workers, helping them understand the integrity of the well and better assess risk.

causes cancer, that some people are excessively vulnerable, and some will develop Electro-Hypersensitivity."

Josh del Sol Beaulieu, co-founder of InPower Movement and director of the documentary *Take Back Your Power*, keenly describes future technology's impact as an attack on our very nature: "The bottom line is that our bodies function by electromagnetic fields. That's how we interface with our world. And what we're talking about here with 5G is an assault on the mechanism that runs us as conscious sentient human beings."

A HUMAN IS NOT A COMPUTER

In a recent interview with *Advertising Age*, Julie Coppernoll, vice president of global marketing at Intel, made it clear that the proliferation of connected technology is the future, saying that the potential of 5G and IoT is that "nothing will be 'mobile' anymore because everything will be mobile."

Perhaps a great sound bite for the TechCrunch Disrupt crowd, but this smart-network world threatens to further disconnect us from our natural environment; a technology-induced alienation detaching us from ourselves and our communities.

And what really happens when you take physical bodies out of the equation? Cultural anthropologist Mieka Polanco, of James Madison University, offers us a sociocultural view: "In anthropology, we talk a lot about how the body interacts with the world, what the body means, and how having a certain body shapes how you see the world—a gendered body, a raced body, a classed body, an aged body, and a sexualized body. Up until recently you had to have a body to have social relationships. Until now."

Beaulieu, of InPower, raises the stakes: "Do we want a society where there's a singularity Google brain that we're all plugged into, that makes all the decisions for us, so that we can just self-gratify ourselves with what we think we need, and what the system is pre-programmed to deliver to us?" And Dr. Russell adds, "We have to draw back from the computers."

As observed by Roxana Marachi, a professor of educational psychology and writer at EduResearcher, we are entering an era in which technology is prized over and above human relationships: "Technology can be a valuable learning tool, but we need to think far more critically about how and when it would be introduced. Many devices are pushed into young children's hands in ways that contradict what we know from research about healthy child development. Infants and toddlers are most vulnerable to developmental impacts, yet don't have the awareness or autonomy to be able to opt out."

But the one thing we tend to forget—as we're drawn into the web of our screens, playlists, and avatars—is that though so much of our interactions have been virtualized, we still do have physical bodies and minds.

Polanco's anthropological research directs us to the work of French philosopher Michel Foucault, whose lifelong interest was how those in power manipulate social attitudes: "Institutions of power and authoritative organizations encourage us to believe that we have no autonomous power, and they have ultimate control over us. But we can only believe that as long as we forget that we have autonomous bodies. The one site institutions cannot reach, cannot exercise their power over, is our body. Because they cannot decouple our bodies from us. That's the one thing they can't take away from us."

And Beaulieu agrees—our awareness is the solution: "Consider, there are frequencies beaming at us, all the time, and these frequencies are correlated with many reports of illness and impairment, plus the supporting science is right there. And yet industry is ramping up this technology without testing, and they're doing it for money, and they've infiltrated the agencies which are supposed to protect us. This is something that you don't ignore."

YOUR HOUSE IS STILL YOUR HOME

Recently, my friend's decade-old hot-water heater broke. I advised him to get a plain vanilla replacement: no smart-enabled bells and whistles; no wireless gadgets infiltrating his home with unnecessary radiofrequency. As we combed through models online—culminating in a convocation with his plumber—we were confronted with one smart unit after the next. In the midst of our quest, my friend held up his cellphone in exasperation, "Why does my cellphone need to talk with my hot-water heater?!"

Good question. Why?

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