

An Open Letter to Phillips Exeter Academy about Wi-Fi

The Exonian November 14, 2013 article concerning my correspondence with the Phillips Exeter Academy administration about Wi-Fi correctly characterizes my position as opposing its installation in schools: <http://theexonian.com/wp-content/uploads/2013/11/11-14-red.pdf>; I write this letter to add context and explain why. I initially contacted Principal Tom Hassan in 2011 prior to the installation of Wi-Fi on campus. He indeed declined to take me up on my offer to review the science of radiofrequency radiation and discuss international developments, stating: “We will move ahead on Wi-Fi, although at this point our plans are just in the conversation stage. But as we move ahead, we will certainly keep your grave reservations in mind.” The cognitive dissonance in these two sentences is jarring, but it is a thought process on exhibit with the administrators of many peer institutions in this country.

At that juncture, the German Federal Office of Radiation Protection had advised all Germans not to install Wi-Fi; certain schools in Germany and Austria (where the Salzburg Health Department advised against its use) banned it. Because of peoples’ relative proximity to Wi-Fi transmitters, Wi-Fi has been exposing most people to more radiation than cell towers, which had already triggered a public health issue prior to Wi-Fi being rolled out widely to the public. This letter written by doctors in Bamberg to the Bavarian government describes the magnitude of the combined problem as it existed nine years ago: <http://www.tetrawatch.net/links/links.php?id=stoiberlet>. The France National Library had Wi-Fi removed after complaints of accessibility by both patrons and librarians. The Swiss Government offered incentives for schools to use hard-wired systems instead of Wi-Fi and issued a report, “Electrosmog in the Environment” that acknowledged that biological effects occur well below international guidelines and provided information about various sources of electromagnetic radiation and how to limit exposure: <http://citizensforsafetechnology.org/uploads/scribd/Electrosmog%20in%20the%20Environment.pdf>.

The first statement, “We will move ahead on Wi-Fi” made it clear to me at the time that the outcome was foreordained. The Exonian article states, “After researching the issue further, Hassan and Exeter’s IT and Health Services chose to proceed with and stick by the tech transition.” Ignoring mounds of evidence that suggest a serious problem is afoot; making claims that that some US government agencies and the American Academy of Pediatrics (AAP) dispute; citing a large bureaucratic body that makes contradictory statements, has conflicts of interest and which usually acknowledges a problem up to 25 years after scientists raise alarm bells, Exeter’s IT department, Health Services and “the team of individuals across the Academy” came to a conclusion that sanctioned a decision that Hassan had previously acknowledged *already having made*.

The leading U.S. authority on the health effects of electromagnetic radiation (Dr. David O. Carpenter) explains that one reason institutions ignore people who bring up evidence about wireless health hazards is that if they were to review it, they would have to acknowledge there is a problem... and then they would have to do something about it. Another expert, L. Lloyd Morgan, Eng. from the U.S. Central Brain Tumor Registry, simply states, “If we do not look, we cannot find.” It is the process of review that is at issue; the “team of individuals across the Academy” does not cite any primary sources, and if a report of the science that was reviewed exists, it has not been produced. It appears that those involved engaged

in a rubber stamp exercise that ultimately boiled down to copying and pasting a false statement from the website of an embroiled arm of the UN.

The doublespeak is even worse in the public education system. In New York State, the Board of Regents put out a report, "Environmental Quality of Schools" that stated that schools should use "less-toxic and less-hazardous products for instruction" and that "electromagnetic field exposure and available prudent avoidance measures should be considered...in determining space utilization in existing facilities and purchase of new and replacement... devices and equipment". Consideration includes "all sources of electromagnetic field exposure in and around the proposed structure." Wi-Fi use contradicts these recommendations. When I pointed this out to them, they acknowledged in writing that "fiber optics may present less of a hazard" but that "districts also struggle with providing state of the art and relevant educational programs for students". I say more about this on pages 151-152 of my paper that was published in *Reviews on Environmental Health* in January: <http://wirelessrighttoknow.com/wp-content/uploads/2011/12/reveh20130990.pdf>. Some states have laws on the books that mandate warnings for the use of toxic substances in occupational settings; California bans them outright in some school grades. Where are the warnings on Wi-Fi'ed tablets and laptops and by the routers?

A few months after our email exchange, the Council of Europe urged schools to ban Wi-Fi and cell phone use on campus, and the World Health Organization (WHO) categorized the radiation emanating from wireless devices and transmitters as a Group 2B (possible) carcinogen. A decade earlier in 2001, the WHO had similarly categorized extra-low frequency (ELF) fields, the radiation coming off power lines and appliances, a quarter of a century after the first epidemiological studies found a link between ELF exposure and increased incidence of childhood leukemia.

A year after the email communication, Exeter began to install Wi-Fi (2012). That year, the alarm was raised by experts in the United States including Dr. David O. Carpenter, member of the President's Cancer Panel, former head of Wadsworth Laboratories for the State of New York and head of the New York Power Lines Project, a court-ordered review of the health effects of ELF. He stated this in a lawsuit to remove Wi-Fi from Portland Public Schools:

In the context of school development, WI-FI exposes building occupants including children and adults constantly from both computers and infrastructure antennas. Duration may be an even more potent contributing factor to RF/MW radiation bioeffects than exposure levels. Chronic, such as all-day, school exposure, is more likely than short and intermittent exposure, such as cell phone use, to produce harmful health effects, and is likely to do so at lower exposure levels.....

Some effects are shown to occur at several hundred thousand times below the FCC public exposure guidelines, which are set based on the fallacious assumption that there are no adverse health effects at exposures that do not cause easily measureable heating. FCC guidelines also only apply to 30-minute public exposures; therefore do not even infer safety at durations>30 minutes, such as in a school setting.....

Exposure to high-frequency RF and MW radiation and also the extreme low frequency (ELF) EM fields that accompany WI-FI exposure have been linked to a variety of adverse health outcomes. Some of the many adverse effects reported to be associated with and/or caused by ELF fields

and/or RF/MW radiation include neurologic, endocrine, immune, cardiac, reproductive and other effects, including cancers.....

Human studies of comparable RF/MW radiation parameters show changes in brain function including memory loss, retarded learning, performance impairment in children, headaches and neurodegenerative conditions, melatonin suppression and sleep disorders, fatigue, hormonal imbalances, immune dysregulation such as allergic and inflammatory responses, cardiac and blood pressure problems, genotoxic effects like miscarriage, cancers such as childhood leukemia, childhood and adult brain tumors, and more.....

To understand the seriousness of this Agent of PM RF/MW radiation in interaction with populations and individuals, we need to consider some basic facts in addition to the many relevant and reliable studies above. For example, where shortwave, AM, FM, TV and cell phone infrastructure frequencies are demonstrated to be harmful, as they consistently are shown to be at low intensities with long duration, then, all other factors being equal, MW radiation at 2.45 GHz will likely be more harmful yet, due to its higher absorption-per-exposure and water molecule resonance. Increasing the constancy and length of exposure toward the maximum of occupational and 24-7 durations will lower the threshold for effects in populations and individuals. Complex radiation microenvironments with pulse-modulated wave and multiple sources, such as are deployed in WI-FI-equipped schools, are more harmful than a single, isolated MW radiation exposure at the same power density and duration.....

The FCC-appointed guideline-setting Commission, ASTM-IEEE, in 1991 referred in its conclusions to RF/MW radiation, the Agent, as a 'Hazard,' specifically setting a 'Hazard Threshold.' It has been discovered that, even amongst the 120 studies chosen by the Committee to prove the validity of its Hazard Threshold, there were 15 studies that concluded adverse effects at levels lower than the Hazard Threshold, thus disproving its validity. Three of these studies actually showed adverse effects at less than 10 percent of the Hazard Threshold. Thus the guidelines have no credibility.....

The large body of scientific literature moreover redundantly proves this Agent to be a hazard. The media-promulgated notion that the relevant scientific studies are inconsistent and inconclusive is false and misleading. Chronic exposure to PM MW radiation harms every individual in a population in some ways, even if these are not always detectable by the individual or consciously attributed to the responsible RF/MW radiation sources. This Agent injures some individuals into a condition in which symptoms will be more easily retriggered with subsequent exposure. And for a priori susceptible individuals and those using electronic medical devices, it can respectively exacerbate the extant medical conditions and disrupt medical device operation, even to the point of death.....

For these reasons, WI-FI must be banned from school deployment.

<http://www.wirelesswatchblog.org/wp-content/uploads/2001/11/Amended-Declaration-of-Dr-David-Carpenter.pdf>.

Later in the year, a report that compiled statements from doctors and scientists around the world opposing Wi-Fi deployment in schools, "Medical and Scientific Experts Call for Safe Technologies in Schools", was issued in the UK: <http://wifiinschools.org.uk/resources/safeschools2012.pdf>.

In 2013, Dr. Martha Herbert, an MDPH pediatric neurologist at Harvard, wrote this to the Los Angeles Unified School District (LAUSD),

EMF/RFR from wifi and cell towers can exert a disorganizing effect on the ability to learn and remember, and can also be destabilizing to immune and metabolic function...Powerful Industrial entities have a vested interest in leading the public to believe that EMF/RFR, which we cannot see, taste or touch, is harmless, but this is not true. <http://www.wifiinschools.com/lausd-testimony.html>.

A few months later, Frank Clegg, the former head of Microsoft Canada, also came out against Wi-Fi in schools in *The Wall Street Journal*, stating, "There are already children who can't go to school because of headaches, nausea and heart problems from the wireless systems." <http://online.wsj.com/article/PR-CO-20130509-906512.html>.

In the fall of 2013, I read a couple of articles in The Exonian; one indicated that landlines had been yanked out of dorm rooms and that students largely were expected to rely on their cell phones. The complaint about the inconvenience raised by one student was valid, but for a reason he might not have appreciated. Several years before, the epidemiologist Devra L. Davis, PhD, MPH, author of Disconnect: The Truth About Cell Phone Radiation, What the Industry has Done to Hide It and How to Protect Your Family: <http://www.disconnectbook.com/>, publicly called on colleges to maintain landlines in light of the brain tumor risks found by the WHO IARC INTERPHONE study and by the studies of Dr. Lennart Hardell, MDPH, whose work was the basis for the WHO Group 2B carcinogenicity determination and for a European Court determining that cell and cordless phones are responsible for brain tumors.

Another article indicated that Wi-Fi had been installed in some dorms over the summer. This meant that Exeter students were approaching 24-7 Wi-Fi exposure, higher than even their peers at day schools with Wi-Fi. Wi-Fi used in schools is much higher-powered than residential Wi-Fi (which is still contraindicated by physicians and scientists who are knowledgeable about the health effects of microwave and other radiofrequency radiation). Instead of thinking about the implications of continual exposure to pulse-modulated microwave radiation, the administration was parsing the issue of whether a student with a wireless card that could call into a cell tower could access the internet after hours and get a jump on peers who didn't own cards or have neighbors with them.

In the name of getting the best of the best, Exonians are being treated to an unprecedented occupational health hazard. Hard-wiring would eliminate radiation exposure, allow all students internet access and eliminate the need for wireless cards (which create more localized and temporary radiation exposures than transmitters in a dorm-wide Wi-Fi system and hence are relatively less egregious.)

By April of this year, this opinion picked up traction in other official quarters; the Israeli Supreme Court issued a conditional injunction that would prohibit the use of Wi-Fi by the Ministry of Education; the Ministry was supposed to show by July 15th why they should not hard-wire the schools (the way we all connected to the internet up until a few years ago – with no exposure to pulse-modulated microwave radiation), or face permanent enjoinder from using Wi-Fi in Israel's schools. The court was persuaded

by testimony of doctors and scientists as well as by adults and students who were getting headaches and other ailments from Wi-Fi; one survey showed that 8.5% of students were getting these symptoms.

The Israeli Ministry of Education still has not answered all of the Court's questions. The Ministry of Health offered to measure the radiation, perform medical checks of the students and institute a procedure for addressing health complaints. The Court postponed the decision of whether to make the conditional injunction a permanent one until February 11, 2015, but the question is when will educational institutions in the U.S. address and eliminate this newly created health hazard?

When I was in graduate school, we had a jack at every seat with an Ethernet connection to plug into our laptops. Starting in the 2000's, it was deemed cheaper to beam the internet across the room with microwave radiation than to keep using fiber-optic cable; indeed, the wireless companies may have partnered with unions to create an exorbitant per-jack installation rate to promote the use of Wi-Fi systems over hard-wiring. A former head of the National Association of Independent Schools (NAIS) indicated to me that U.S. private schools like to do what the other schools are doing, and they don't like to admit when they may have to re-do a costly investment. While this explains some of the psychosocial underpinnings for the ill-advised policy of Wi-Fi use, it will be small consolation to those who are already developing hypersensitivity to microwave radiation, to those who will develop cancer or a neurotransmitter disease in the future from it and to those whose fertility will be permanently impaired by it. (See: <http://www.bioinitiative.org/>; this is a compendium of scientific studies on radiofrequency radiation that was first published in 2007, and updated in 2013. In the interim, the August 2009 issue of *Pathophysiology* published papers from the first Bioinitiative Report).

Meanwhile it is taken as an article of faith that Wi-Fi is an educational tool. It is no such thing; Wi-Fi is merely the latest method of connecting to the internet, and an unsafe one at that.

Wi-Fi is both poor man's and lazy man's broadband; finances and the annoyance of IT installers with laying cables are the chief arguments used to justify the replacement of safe and ultimately more reliable and secure hard-wired fiber optic connections with continuous transmissions of microwave radiation orders of magnitude higher than the public was regularly exposed to before the rollout of this technology. Another stated justification is being able to get an internet connection in every nook and cranny of the building; this needs to be re-examined; there are reasons besides the gratuitous radiation exposure not to be hyper-connected to the net. Please see: Nicholas Carr's [The Shallows: What the Internet is Doing to Our Brains](#) for an extended analysis of this and related topics.

If you look at the history of toxic products in the US, we as a society tend to repeat the mistakes of the past and insist something is safe long past the point where evidence shows that it is not, especially when a lot of money is at stake. Leaded gasoline, responsible for significant IQ drops in children, wasn't phased out until 1995 even though its neurotoxic effects were known in the 20's. Smoking was banned in public in Germany during the Third Reich, while the U.S. mocked Nazi scientists (in a convenient move for an industry that eventually accounted for 25% of advertising dollars) and didn't start to institute public bans until 1995. The asbestos industry insisted that people could just as easily get chest disease from digging in their gardens at midnight as from use of their product; yet Pliny the Younger had noted

back in the 1st century AD that slaves who worked with asbestos got sick, and modern day studies showed it was toxic as early as 1930. However, asbestos phase-out did not begin until 1989 (and it is still in limited use in this country while it is banned in other major industrialized countries).

Video display terminals, rolled out in the 70's, arguably created the first public health crisis from nonionizing electromagnetic radiation: <http://www.atarimagazines.com/startv5n1/bodyelectronic.html>. They were yanked off the market by industry after the HMO Kaiser Permanente noted that the ELF radiation that they emitted was responsible for stillbirths, birth defects and eye damage. Subsequent computer terminals were redesigned so the wiring causes the fields to be cancelled out. (With today's wireless technologies, redesign isn't possible because microwaves are beamed across the room instead of the signals being transmitted through a wire; remediation involves removal of wireless microwave transmitters and re-installation of Ethernet cables). It is also noteworthy that the U.S. government never strengthened radiation standards after the VDT crisis; it was the insurance industry which corrected the problem by financially de-incentivizing it. It is also worth noting that The New York Times pooh-poohed the science in a public editorial that was issued shortly before the voluntary removal by industry... all while the paper was fending off lawsuits by its own employees who were injured by these terminals: <http://www.nytimes.com/1988/05/26/opinion/suffolk-s-reckless-screen-scream.html>.

Let me explain how I personally came to the conclusion that Wi-Fi has no place in schools (via a technical analysis beyond consideration of the aforementioned recurring themes of corporate influence and interference with scientific investigation and reporting.)

In 1993, on the basis of literature of populations exposed to other microwave emitting towers such as TV broadcast, air traffic control and radar towers, the California Public Utilities Commission (CPUC) recommended that cell towers and transmitters be kept away from schools and hospitals. "Away" was interpreted as 1,500 feet or the distance at which the radiation power density of a particular tower levelled off. Municipalities which regulated cell tower placement extended this guidance to habited areas -- homes, frequently trafficked areas, buildings where people spend the majority of their time, etc. One such municipality was Wayland, MA, the home of Amar Bose, who as founder and chairman of the Bose Corporation was acquainted with the health hazards of radiofrequency radiation and advocated for rational transmitter siting. If you go to Wayland, you will see that the cell towers are largely kept to one end of town and away from houses. The thrust of this advice was reiterated in 2009 by an EU Parliamentary Resolution: <http://www.europarl.europa.eu/sides/getDoc.do?type=TA&reference=P6-TA-2009-0216&language=EN>. Studies conducted since cell towers were rolled out show large tranches of people -- elevated percentages of respondents within 1,500 feet -- exhibiting symptoms of Electro-hypersensitivity (EHS) (also called Electromagnetic Intolerance Syndrome or Microwave Sickness). See: http://wifiinschools.com/uploads/3/0/4/2/3042232/levittlai_bioeffects_from_cell_towers_rfr_antennae.pdf. Some of these studies reported power densities in the lower range of exposures one would find in a Wi-Fi'd classroom.

All of these studies were done abroad (although the meta review above was done by U.S. researchers); no studies have been commissioned in the United States where the EPA's bio-electromagnetics laboratory was defunded shortly after the EPA twice proposed categorizing electromagnetic fields as a

carcinogen and the wireless industry started ramping up in the early 90's. (Certainly EPA's 1984 report "Biological Effects of Radiofrequency Radiation" suggested such a categorization was warranted: <http://nepis.epa.gov/Exe/ZyPURL.cgi?Dockey=300065H1.txt>; neutered of power, EPA made one last ditch effort to try to convince the FCC that its safety guidelines were inadequate and that RF exposures in so-called "uncontrolled environments", like Wi-Fi in an office or classroom, were poorly defined: http://www.emrpolicy.org/litigation/case_law/docs/epa_to_fcc_3nov_93.pdf.) There are volumes of documents dating back well over half a century linking exposures from this radiation to the development of EHS/Microwave Sickness including studies commissioned by the US Armed Forces, governments around the world and other institutions. These documents, which describe symptoms and syndromes created by wireless exposure that are seen in clinical settings by doctors and scientists today, include "Clinical and Hygienic Aspects of Exposure to Electromagnetic Fields" by Christopher Dodge of the U.S. Naval Observatory in 1969, which lists effects from exposures commensurate with proximity to transmitters: http://www.magdahavas.com/wordpress/wp-content/uploads/2010/08/Dodge_1969.pdf and "The Effect of Microwaves on the Central Nervous System" by Bergman, which was translated from German by the Ford Motor Company in 1965: http://www.magdahavas.com/wordpress/wp-content/uploads/2010/12/German_Ford_Motor_company_The_Effect_of_Microwaves_on_The_Central_Nervous_System.pdf.

More recently, the private sector has acknowledged these problems: in the 90's, the mobile phone giant Ericsson commissioned a report about their engineers who had become hyper-sensitized from cell phone radiation exposures, calling the condition a "scourge of modern civilization". Deutsche Telekom and T- Mobil also commissioned "The Ecolog Report" about the hazards of cell phone use and wireless radiation exposure: <http://www.hese-project.org/hese-uk/en/papers/ecolog2000.pdf>.

While private corporations and insurance companies around the world sound the alarm bells, the US FCC and FDA don't admit the problems or offer substantive advice to Americans on how to reduce radiation exposure (instead fingering each other as being responsible for certifying the safety of emissions from wireless transmitting devices), while other U.S. agencies acknowledge the seriousness of the problem: the United States Architectural and Transportation Barriers Compliance Board (the United States Access Board) recognized the existence of disabling electromagnetic sensitivities in the Federal Register in 2002 and put out a report in conjunction with the National Institute of Buildings Sciences (NIBS) in 2005 stating that to accommodate those who are sensitive to these new pollutants, "Wireless ('Bluetooth' type) connections should be avoided, or areas of their use should be 'contained' by using foil-backed drywall or other incorporation of a foil or metal barrier." The report explicitly states, "Fiber optic connectivity is preferred for computer networks for communication." Stated another way, Wi-Fi (which operates at the same frequency as Bluetooth...and microwave ovens) should be scarce (if used at all) and confined to specific areas so it doesn't spill out into the whole building: http://web.archive.org/web/20060714175343/ieq.nibs.org/ieq_project.pdf.

The Interagency Working Group on Radiofrequency Radiation (RFAWG) indicated that standards are not protective of human health in 1999: http://www.emrpolicy.org/litigation/case_law/docs/exhibit_a.pdf. The RFAWG made the point 15 years ago that, "The... approach of basing the exposure limits on acute effects data with an extrapolation to unlimited chronic exposure durations is problematic"; Carpenter

re-asserts this point in his 2012 declaration in *AHM v. Portland PPS*, in an excerpt quoted on page 2 of this letter. In 2002 Senior Scientist Norbert Hankin of the EPA wrote a letter also conceding that there are no long-term standards for radiation exposure, stating, “the generalization by many that the guidelines protect human beings from harm by any and all mechanisms is not justified.”

<http://www.aemc.gov.au/Media/docs/Market-Review-Submission-EPR0022---Helen-Weir---121009---Supporting-document-3-85f00cf2-edec-4fb3-9ce4-d3166da1e356-0.PDF>.

The exposure guidelines were set during a time that didn’t contemplate 5-6 hours a day of Wi-Fi in the classroom, never mind all the hours of the day spent in the dorm with transmitters on. (The sports fields and the Squamscott River now seem to be some of the only places on campus to avoid exposure.) Furthermore, they weren’t set for children or adolescents or women, people with pre-existing conditions or the elderly -- in short, the majority of the population. Standards were set by industry and set high enough so that devices could operate, not so that the public’s health would be protected. W. Gregory Lotz, the Chief of the Physical Agents Effects Branch of the Division of Biomedical and Behavioral Science at the National Institute of Occupational Safety and Health (NIOSH) expressed the view that hard-wiring is a safer option than wireless laptops and base stations in a classroom environment. When asked specifically about using Wi-Fi in schools, the EPA’s Hankin said, “In my personal opinion, I wouldn’t do it.”

A letter sent in February of this year from the US Department of the Interior (DOI) to the National Telecommunications and Information Administration (NTIA) explicitly states, “the electromagnetic radiation standards used by the Federal Communications Commission (FCC) continue to be based on thermal heating, a criterion now nearly 30 years out of date and inapplicable today.”

http://www.ntia.doc.gov/files/ntia/us_doi_comments.pdf.

These statements coming from U.S. government agencies and agents stand in contrast to Diane Fandrich’s, director of Exeter’s IT Services, that “there is no convincing scientific evidence that the weak radio frequency signals from base stations and wireless networks cause adverse health effects”.

The National Academy of Sciences (NAS) also put out a report in 2008, “Identification of Research Needs Relating to Adverse Health Effects of Wireless Communication” which refers to the need to characterize specific aspects of real-life public exposure to wireless devices and technology such as exposure to juveniles; models for children as current safety guidelines are based on calculations made on a 200-lb male; hot spot concentration from metal rim glasses, braces, earrings, and medical devices; and effects of cell phones, Wi-Fi, laptops etc. on EEG and neural networks. Six years later, no such work has been performed in the U.S. when there is already evidence that radiation at levels emitted by Wi-Fi are already linked to disease and development of EHS: <http://www.bioinitiative.org/rf-color-charts/> and <http://www.es-uk.info/15-home/32-electromagnetic-sensitivity-and-electromagnetic-hypersensitivity-a-summary-by-michael-bevington-new-edition-march-2013.html>.

Most people don't realize that Wi-Fi'ed institutions like schools generally expose people to more radiation than if they were picnic-ing all day close to a cell tower, which is contraindicated by the aforementioned CPUC and EU precautionary guidance. This is not an opinion, but a FACT which can be

verified by looking at the mathematical formula for radiation exposure in FCC OET Bulletin 69 and/or measuring the radiation yourself with a radiofrequency meter. In the recent past, people who developed EHS could manage the situation simply by keeping a wide berth from cell towers. During the Cold War, people who worked for the military, who developed the sensitivity which was then termed Microwave Sickness, were just assigned to different jobs -- away from radar to avoid exposure. Now with Wi-Fi (which emits microwave radiation, like radar) having become ubiquitous, with the equivalent or more of the amount of radiation than one would get from too close proximity to a cell tower now existing in workplaces, schools, etc., problematic exposures are now the norm. Therefore, what was once a problem of geography is now a public health problem. In addition, many more people who were previously healthy have developed EHS or other related symptoms because of chronic exposure to Wi-Fi... Wi-Fi is both the cause of the problem and an ongoing trigger and ultimately a barrier to access for people who develop the condition.

It is worth noting that the Town of Hempstead, NY passed a law in 2010 keeping cell towers 1,500 feet away from schools, houses and places of worship after they saw clusters of people near cell towers developing cancer. (The Telecommunications Act of 1996 forbids making cell tower placement determinations on the basis of health, but municipalities are allowed to make regulations on the basis of aesthetic and "property devaluation" criteria.) However, the Wi-Fi in schools in Hempstead exposes students to more radiation than a cell tower that would be forbidden under the town's code. This fact underscores the social innumeracy that is in evidence when people complain (rightfully) about inappropriately sited cell towers but simultaneously promote and use Wi-Fi.

Another baffling aspect of this innumeracy is that the manuals for microwave ovens sold in the 70's and 80' explained that if one wanted to avoid microwave exposure, one should stay away from the oven while it was in use. (Yes, the exposures from the ovens were legal -- except for the 90,000 ovens that were said to have "leaked" -- but the salient point is that guidance was provided to reduce or eliminate radiation exposure.) Much of Wi-Fi operates at the same frequency as a microwave oven -- 2.45 GHz. (The other frequency used is 5 GHz.) If one compares the radiation within 12 feet of a microwave oven, one will find that there is more radiation in an office or school with multiple routers. How had it been potentially worth avoiding exposure to certain radiation levels for the few minutes out of the day the microwave oven was on, but now it is NOT a problem to be exposed to more than those levels ALL DAY at work and at school (and possibly all night at home or in the dorm)? My local grocery store has a sign on the door that says "Warning: Microwave Oven in Use". Why do stores with Wi-Fi not have signs that warn "Wi-Fi in Use"? Wi-Fi creates higher exposures than a microwave oven and continuous exposures, not intermittent ones. In 2008, the FDA website warned the 20 million Americans with medical implant devices that they conceivably could be shut off by microwaves, including a Wi-Fi router.

One of the ironies about EHS (scientists say the symptoms are almost identical to Gulf War Syndrome) is that for people who have it who are in an electrically clean environment (away from Wi-Fi, cell towers, "smart" meters, public transport where 100 people can be using iPhones in a tight metal enclosed space which intensifies the radiation, etc.), they are asymptomatic....but when exposed, symptoms (pounding headaches, heart rate changes, muscle weakness, etc.) come on and can last for hours or days depending upon the sensitivity of the individual. In essence it is like having temporary Gulf War

Syndrome; the symptoms can be eliminated by avoiding sources of exposure. Besides the debilitating symptoms and accompanying recovery periods from exposure, the other reason people with EHS must avoid sources of microwave radiation is that subsequent re-exposures cause the symptoms to come quicker and last longer. Modern day doctors with large cohorts of patients with EHS report what early Soviet literature on the problem did -- that those who don't remove themselves from most exposure eventually can't reverse the symptoms at all. One European doctor developed a scan that shows vascular spasms in the brains of these patients after they have been exposed to Wi-Fi and the like; he has also found permanent brain damage in those who have been chronically exposed.

In practice, there is a tranche of people who get headaches or heart palpitations from Wi-Fi that clear up within an hour or two after exposure (until they are re-exposed), while the most seriously affected must take a day or more without exposure to eliminate symptoms. Also, for many, there is more of a delay from exposure till onset of symptoms, while some manifest symptoms quickly. Proximity to the source of exposure as well as radiation intensity, frequency and duration also contribute to the severity of symptoms. The issue with EHS is that while hyper-sensitization can appear to happen overnight (many sufferers can pinpoint the day they "tipped over"), it can take time to morph from being merely sensitized to hyper-sensitized and can take years before the impairment becomes totally disabling: it starts off with symptoms that are difficult to link to exposure-- sleep problems, irritability, exhaustion, nausea, rashes, sinus problems, light pressure in the head-- and eventually encompasses other symptoms that can include pounding headaches, heart rate variability, dysautonomia, gastrointestinal pain, concentration and executive function impairments, and other pain. The symptoms clear up when the person is removed from exposure: <http://wirelessrighttoknow.com/ehs/>.

Sweden acknowledges that 3% of its population is Electro-sensitive (while 5% have registered with the Swedish Association for the Electro HyperSensitive), provides accommodation on transport and in the workplace, and the Stockholm municipality provides housing in the countryside with no Wi-Fi or shielded apartments in cities for people with EHS. (California recognizes the 3% number.) Russia and Sweden both provide wings of hospitals without wireless so people who have developed EHS can access medical care. The Austrian Medical Association has detailed diagnostic criteria for EHS (which they call EMF Syndrome), and they define a severe exposure at the lower end of Wi-Fi: <http://freiburger-appell-2012.info/media/EMF%20Guideline%20OAK-AG%20%202012%2003%2003.pdf>. The U.S.-based International Institute for Building-Biology and Ecology standards, a touch stricter than the Austrians', even build in an extra order of magnitude to define a radiation level of "no concern": <http://hbelc.org/>.

There are a number of studies, which I footnote in my *Rev. Environ. Health* paper, showing a range from country to country of reported people with EHS: 2.6%-12%. Dr. Carpenter said that his best estimate is that the number of people with severe EHS is .5% and that at least 10% are reacting with symptoms of sensitivity to a greater or lesser degree. Scientists like Magda Havas and Olle Johansson state that 20%-30% are manifesting symptoms of sensitivity and 3% has severe EHS; however, even Carpenter's more conservative estimate is enough to suggest a serious problem is afoot. However, while doctors in Europe and elsewhere are more conversant with wireless health hazards (in Canada, Toronto Women's Hospital holds clinics to educate doctors about EHS: <http://www.womenscollegehospital.ca/news-and-events/connect/the-effects-of-invisible-waves> and in the UK, doctors issued this letter of warning:

<http://memorygapdotorg.files.wordpress.com/2013/06/uk-doctors-letter-wifi-ssita-26-june-2013.pdf>), US doctors are largely unaware of both the health problems caused and exacerbated by continuous exposures to wireless and the aforementioned 2005 U.S. Access Board report identifying Wi-Fi as an access barrier (just as not having a wheelchair ramp would be an access barrier); they generally have Wi-Fi in their offices, having been sold it as an “office solution” or “patient perk”.

Members of the American Academy of Environmental Medicine (AAEM) are a noted exception, and the organization has issued a number of letters about this problem, stating that children and people with most medical conditions should avoid Wi-Fi: <http://aaemonline.org/emfpositionstatement.pdf> and <http://aaemonline.org/AAEMEMFmedicalconditions.pdf>. The second letter refers to the need to reduce exposures to all wireless radiation; Wi-Fi is a continual emitter and the largest source of exposure for many, but smartphones with their intermittent spikes and smart meters with their continuously intermittent pulses are other transmitters that reside closer to people that contribute to problematic exposures. “Smart” phones also emit orders of magnitude more radiation (as apps are updating) than their (dumber?) flip-phone cousins. If everyone in a classroom has their phone on, this can add to the signal smog in the room. It bears repeating the words on page 3 of this letter from David Carpenter’s declaration: “Complex radiation micro-environments with...multiple sources...are more harmful than a single, isolated MW radiation exposure...” Other US MD’s who have been outspoken about the problem include Dr. Karl Maret of the Dove Health Alliance in Aptos, CA, who issued this statement about smart meters to the California Council on Science and Technology: http://sagereports.com/smart-meter-rf/docs/letters/Maret_-_CCST_Commentary_1-31-2011_final.pdf and Dr. Cindy L. Russell, VP of Community Health at the Santa Clara County Medical Association, who wrote <http://www.sccma-mcms.org/Portals/19/assets/docs/Wi-Fi%20in%20Schools%20rev.pdf>, “How the Internet and Wi-Fi Can Affect Learning in Schools”. Dr. Carpenter lists these additional references at the Institute for Health and the Environment’s website: http://www.albany.edu/ihe/Emerging_Environmental_Issues.php.

Doctors using Wi-Fi in their offices today are like doctors refusing to stop smoking in their offices in the 1950’s. (As counterintuitive as it may seem, doctors are not always on the cutting edge of identifying health hazards -- they are more focused on treating disease; in the 20’s, MDs would have garden parties with x-ray machines to entertain guests; there have been a series of articles recently that show that doctors are *still* under-informed about the radiation risks of diagnostic tests they order cavalierly: http://topics.nytimes.com/top/news/us/series/radiation_boom/index.html.) Back to cigarettes -- in the 80’s there was smoking in the staff room of my elementary school; today people would be horrified at that practice since second-hand smoke is linked with lung cancer, albeit for less than 1% of the population. Besides the conservatively-estimated 10% who are affected by *second-hand radiation* to varying degrees, levels of radiation existing in public constitute a cancer and neurotransmitter disease risk for everyone else. See again: www.bioinitiative.org. One study of people exposed to radiation of the same frequency emitted by a Wi-Fi router shows heart rate variability occurring in over 20% of the subjects, some of whom do not even describe themselves as having any conscious perception of sensitivity to wireless radiation (participants were exposed under double blind conditions): http://www.icems.eu/papers/ramazzini_library5_part1.pdf. This should be very worrisome to schools.

None of it should be surprising, though, when one reads the Cold War literature on Microwave Sickness or looks at the literature on people exposed to TV broadcast, radar, air-traffic control or cell towers.

Another thing which should concern schools is this slide presented by Hardell at the Corporate Interference with Science and Health conference last year in New York City: (see third thumbnail, time stamp 59:45 at <http://www.corporateinterference.org/videos.html>.) It states, "An iPad should be totally banned in most environments, if you're going to care about health risks" and indicates that iPads are emitting up to 100,000 times too much radiation. The iPad manual itself should raise some questions: it states, "For optimal mobile device performance and so that human exposure to RF energy does not exceed the FCC...guidelines,... orient the device with the cellular antenna (located under the black edge at the top of the device) away from your body or other objects." My letter is full of citations that show serious problems at a fraction of the FCC limits; indeed 1/100,000 of the level of the peak spikes of radiation emitted by an iPad, the level that Hardell indicates would be safe enough for an iPad to operate, is only .0002% of the FCC guidelines (some people with severe EHS manifest symptoms below even that amount). Have students been instructed on how to operate the iPad so their exposures don't breach the lax FCC limits at least? This would be important information, considering that the world's leading expert, the man whose work was used by a European court to link phones to brain tumors and by the WHO to categorize the carcinogenicity of this radiation in the same group as lead and diesel exhaust, indicates that exposure to more than 1/500,000th of the FCC limit is harmful. The iPad and other so-called educational tablets are 2014's VDT, asbestos, lead and cigarettes and will be understood in the future to be defective products; they should have been manufactured with an Ethernet cable so that they could be operated without exposing users to pulse-modulated microwaves.

There are a number of prominent people/prominent relatives of people with EHS who are outspoken on the public health problem that exists-- most notably Gro Harlem Brundtland, the former head of the WHO. Others include Brian Stein, the former CEO of Samworth Brothers UK (links to his lectures are here: <http://vimeo.com/24505286> Part I; <http://vimeo.com/24514653> Part II), Frank Clegg, the former head of Microsoft Canada, and author and integrative cardiologist Stephen Sinatra. The Los Alamos physicist William Bruno developed EHS on the job; he subsequently was accommodated with a tranche of the building without Wi-Fi so he could continue to work there. There are people reasoning with or paying neighbors to shut off their Wi-Fi so they still can live in their homes; there are even doctors who can no longer work in ER's since the operating rooms are largely Wi-Fi'ed now. The head of Belgacom, Didier Bellens, banned Wi-Fi from his floor, begging the question of whether he himself is rendered ill by his own product or if he just does it for security reasons: <http://www.emfacts.com/2012/12/the-head-of-belgiums-largest-cellphone-company-bans-wi-fi-from-his-offices-and-tells-kids-cellphones-are-dangerous/>.

Clegg, who held a press conference in June calling for the removal of Wi-Fi in schools, points out that EHS is not something one is "born with"; it comes from repeated exposure to publicly allowable levels of radiation that didn't exist indoors (or outdoors in most places except near a cell tower) a decade ago. He also makes the interesting observation that the Canadian government used to acknowledge that "Certain members of the general public may be more susceptible to harm from RF and microwave exposure" until the sentence was removed from the Canadian Government's website and guidelines in

2009 after wireless internet was rolled out en masse: <http://vitalitymagazine.com/article/invisible-threat/>. In the US, the FCC allowed an industry organization to set similar standards -- to repeat, they were set so that the devices could work, not to protect the public's health.

The former acknowledgment by the Canadian government and current acknowledgment by the Swiss government echoes one that had been made in 2002 by the International Commission on Non-Ionizing Radiation Protection (ICNIRP), a body which includes members who have taken money from industry, which clearly has an incentive not to acknowledge these inconvenient truths:

Different groups in a population may have differences in their ability to tolerate a particular NIR (non-ionizing radiation) exposure. For example, children, the elderly, and some chronically ill people might have a lower tolerance for one or more forms of NIR exposure than the rest of the population. Under such circumstances, it may be useful or necessary to develop separate guideline levels for different groups within the general population, but it may be more effective to adjust the guidelines for the general population to include such groups.

Some guidelines may still not provide adequate protection for certain sensitive individuals nor for normal individuals exposed concomitantly to other agents, which may exacerbate the effect of the NIR exposure... Where such situations have been identified, appropriate specific advice should be developed within the context of scientific knowledge.

<https://www.icnirp.org/documents/philosophy.pdf>

ICNIRP got most of the story right, except there are plenty of adults, including ones mentioned on page 12 who "have a lower tolerance for one or more forms of NIR exposure", who otherwise are NOT chronically ill. Someone with a cat or peanut allergy is not chronically ill; however if they were in a situation where they were regularly exposed to cats or peanuts, they would present as chronically ill. Even ICNIRP's partial description paints a Stygian picture of a society with a public health problem where ubiquitous and chronic exposures, including exposures that lead to interactions between RF and chemicals (which can turn up in food, cosmetics, household products, and other agents people can come into contact with in daily life as well as in occupational settings), hurt subsets of the population.

If you think you have any of the symptoms described on page 10, take the opportunity on school breaks to spend a week or so without Wi-Fi exposure, not holding the cell phone to your head (per the manual), not using Bluetooth and unplugging cordless phones; the difference in functioning should be readily apparent to those who are affected by this radiation. I also recommend that Exeter students get a radiofrequency meter; one can be rented cheaply from Magnetic Sciences and used to compare measurements of Wi-Fi in classrooms and other public areas to levels at various distances from cell towers: <http://www.magneticciences.com/rent-gaussmeter/>. Then, compare the levels recorded to exposure levels correlated with serious health effects: <http://www.bioinitiative.org/rf-color-charts/>. If you buy the argument that the CPUC laid out (21 years ago) -- that cell towers should be kept away from schools, you should start to wonder if having Wi-Fi exposures in classrooms of the Academy Building or Phillips Hall that are in the same order of magnitude or higher than having a cell tower nearby is a good idea. The meter will let you see how radiation drops with the square of distance, and how a device that isn't a continual emitter, like a phone, is a much different exposure than sitting in a room with a

transmitter. I explain in my paper that though the cell phone and brain tumor connection receives the most attention, people are increasingly getting more radiation from passive exposure to transmitters.

The Austrian Medical Association Guidelines explain that most patients self-diagnose; although, it is harder to do at the onset of the syndrome when the symptoms are harder to pinpoint -- manifestations like a sleep disorder, fatigue or aches and pains. After seeing that exposures correlate with symptoms, one can take a case history to an environmental medicine doctor. A neurologist who understands what this syndrome is, like Dr. Herbert, who is nearby at Harvard, can point you in the right direction as well. The symptoms are misdiagnosed by most U.S. primary care practitioners who have been sending those complaining of headaches to neurologists who have been told by the drug company Allergan that there is a mystery condition called "chronic migraine": <http://www.botoxchronicmigraine.com/have-chronic-migraine/> and that shots of botulinum toxin (Botox) into the head and neck can lessen the intensity (but not eliminate) these headaches. Those with muscle pain and fibromyalgia-type symptoms are given drugs like Lyrica, Neurontin and Celebrex or high doses of Tylenol. Those who have developed a "sleep disorder" are given things like Ambien, Lunesta, or a benzodiazepine. Anti-Depressants are prescribed for all of these symptoms. Others are given narcotics. These drugs dull some of the symptoms for some but not for others, create side effects that affect brain functioning and metabolism, don't address the cause of the problem and put stress on the liver. When one is allergic to a toxic substance, the correct cure is to avoid the toxic substance. The failure to understand or care about cause and effect is morally problematic because the trigger, wireless radiation, causes damage over the long term; the early Soviet studies reported that symptoms come sooner and last longer and eventually over time can be lethal. (See Ana Johnson Liakouris' paper "Radiofrequency RF Sickness in the Lilienfeld Study: An Effect of Modulated Microwaves?" <http://www.emrpolicy.org/faq/liakouris.pdf>.)

In any event, what people who are getting headaches and other debilitating symptoms from Wi-Fi need to do is get accommodation under the Americans with Disabilities Act (ADA) and get transmitters shut off in critical settings like schools, doctors' offices, courts, etc., so they can function as they did before neurotoxic exposures were introduced into the indoor building environment. Sweden has formalized procedures to get this accommodation. Americans must press these claims with each institution they must access. It is difficult for those in the early stages of sensitization to understand that they are reacting to an environmental trigger and that the impairment they are experiencing is a functional impairment that can be eliminated by remediating the environment they are in. It requires a shift in thinking to grasp that this relief can be achieved by exercising their civil rights, not by bouncing from doctor to doctor who write hard-core pharmaceutical prescriptions without understanding the condition at hand or what the correct solution is (return to an electromagnetically appropriate environment that existed in buildings until recently). The EU acknowledged that the number of people who have manifested the syndrome has increased exponentially since the recent practice of putting transmitters inside buildings began: <http://www.europarl.europa.eu/sides/getDoc.do?type=WDECL&reference=P7-DCL-2012-0014&format=PDF&language=EN>. The question of whether the percentage of the population with Electro-hypersensitivity will continue to rise exponentially as people reach their thresholds of cumulative exposure to this neurotoxin and carcinogen was posed by Hallberg and Oberfeld in *Electromagnetic Biology and Medicine*: http://www.next-up.org/pdf/EHS2006_HallbergOberfeld.pdf.

Another recent historical analogue would be the practice by department stores of spritzing perfume at those who entered their premises in a bid to sell their wares. There was product to be sold, and they were literally going to market a taste of it to all who crossed their threshold, whether they found it annoying or were brittle enough to find it debilitating. After a series of lawsuits that likened involuntary exposure from perfume clouds to forced consumption of second-hand smoke, clerks now ask people if they want to smell a blotter of perfume or spritz their own wrists so that those who opt-out are not forced to endure plumes of chemicals as they walk by. I mentioned peanut allergies on page 13, and while it is true that some will not accommodate those with severe peanut allergies, they are at least given warnings by airlines and other institutions which cannot completely guarantee their absence in a circumscribed area. Right now people with EHS are viewed similarly to those with severe peanut allergies, but the peanut allergy sufferers are accommodated by schools, courts, libraries, hospitals, etc. Also those on the spectrum of sensitivity to certain levels of microwaves are harder pressed to avoid them, and thus often have continual versus episodic impairment. Also, their numbers dwarf those with allergies to peanuts. Hallberg and Oberfeld's letter raises questions about what will happen if people become hypersensitive to microwaves at their estimated rates; given the current evidence, the situation should be viewed like the perfume-clouds-in-the-department-store problem, but as the numbers of extremely affected rise (as higher and cumulative exposures increase with new devices and transmitters), will society just have entirely separate institutions for those who can't tolerate the uncontrolled public RF environments the EPA questioned in 1993, confine the emissions per the U.S. Access Board guidelines or continue to relegate the most sensitive to the Hobbesian wilderness?

Getting back to the statements by administrators who sanctioned the decision that had already been made to “[move ahead on Wi-Fi](#)”, I have already shown that Exeter's IT and Health Service's assertion of lack of convincing evidence of adverse health effects from wireless base stations and networks contradicts those of the U.S. Access Board, NIBS, the DOI, and the Interagency Working Group on Radiofrequency Radiation. (Note: The DOI letter was issued after campus-wide installation and after the November [Exonian](#) article.) Exeter's statement is not in line with the AAP position either, which urges

... the FCC to adopt radiation standards that protect children's health and well-being. Children are not little adults and are disproportionately impacted by all environmental exposures including cell phone radiation. Current FCC standards do not account for the unique vulnerability and use patterns specific to pregnant women and children. It is essential that any new standard for cell phones or other wireless devices be based on protecting the youngest and most vulnerable populations to ensure they are safeguarded throughout their lifetimes....The AAP supports the reassessment of radiation standards for cell phones and other wireless products and the adoption of standards that are protective of children and reflect current use patterns.

The AAP's and other selected letters to the FCC about current exposure standards in response to their 2013 Request for Comment are here: <http://www.saferemr.com/2013/11/everything-you-wanted-to-know-about.html>.

As to the issue of the WHO statement that there is "there is no convincing scientific evidence that the weak radio frequency signals from base stations and wireless networks cause adverse health effects", it comes from the WHO EMF Project, whose head took funds from the wireless industry that were routed

through the Royal Adelaide Hospital (see Dr. Davis' [Disconnect](#) for a recounting of this episode.) On the other hand, the WHO International Agency for Research on Cancer (IARC) categorized this radiation as a Group 2B (possible) carcinogen in 2011; Diesel exhaust and lead are in this category:

http://electromagnetichealth.org/wp-content/uploads/2012/01/12-30-11_Economist_Critique.pdf.

Hardell, whose work was largely the basis for this categorization, has stated that enough evidence existed to have categorized it a Class 1 carcinogen (which would have been politically untenable because it would have forced governments to adopt major limitations on radiofrequency transmission and hence wireless device use): <http://wirelessrighttoknow.com/wp-content/uploads/2011/12/Hardell-Carlberg-Rev-Env-Health-2013.pdf>.

Prior to its 2B finding, the IARC committee suffered the public embarrassment of having its head, Anders Albohm, kicked out due to the fact that both he and his brother consult to the wireless industry. To track various conflicts and contradictory statements emanating from different arms of the WHO, see <http://betweenrockandhardplace.files.wordpress.com/2014/02/who-knew-the-elephant-in-the-room.pdf> and http://emfacts.com/download/IARC_2011_IARC_May_5_FINAL.pdf. It should also be noted that the year before the 2B carcinogenicity determination, the WHO INTERPHONE report linked cell phone use (a half hour a day for 10 years) to a doubling of glioma risk as well as to increases in acoustic neuroma and parotid gland cancer. Today, people who sit in Wi-Fi all day are getting more cumulative radiation than most people in the INTERPHONE studies were getting from their cell phones.

Even more damning is that the WHO sponsored a symposium in Warsaw in 1973 (along with the then-named U.S. Department of Health, Education and Welfare) that put out a report that includes findings that contradict its current position that there is a "lack of convincing evidence of adverse health effects from wireless base stations": http://mistic.heig-vd.ch/taillard/microwave_effects/. Perhaps the WHO has institutional amnesia...or perhaps their corporate donors caused the international organization to ignore previously acknowledged evidence as industry has been rolling out more products that emit higher and continuous levels of radiofrequency radiation.

In 1981, before Wi-Fi and many cell towers existed, WHO published another report on RF that stated,

General population exposure from man-made sources of microwave and RF radiation now exceeds that from natural sources by many orders of magnitude. The rapid proliferation of such sources and the substantial increase in radiation levels is likely to produce "electromagnetic pollution". Man-made sources include: radar...broadcasting and TV networks and telecommunication equipment...it had been observed in some countries that occupational microwave exposure led to the appearance of autonomic and central nervous system disturbances, asthenic syndromes, and other chronic effects (Gordon, 1966; Marha et al., 1971; Dumanski et al., 1975; Serdjuk, 1977)...Subjective complaints consisted of headaches, irritability, sleep disturbance, weakness, decrease in sexual activity (libido), pains in the chest, and general poorly defined feelings of ill health.... Similar syndromes were reported in France by Deroche (1971) and in Israel by Moscovici et al. (1974).

The symptoms described are Microwave Sickness/EHS. Some of these exposures were from shorter duration higher intensity fields, but as indicated on pages 3 and 13, cumulative exposure from lower intensity fields from Wi-Fi and the like can trigger this condition in people. Other scientific studies by

the Swedish neuro-oncologist Leif Salford and by W. Ross Adey (formerly of the Brain Research Institute of UCLA, the Veterans Administration hospital (VA) and the Department of Defense (DoD)) show that there are power density and frequency windows that are particularly bioactive; in other words, the dose is not the only factor precipitating the onset of biological effects. The above-mentioned WHO-sponsored 1973 symposium report documented biological effects and symptoms at levels of radiation one would get near some Wi-Fi transmitters. Yet, as The Exonian reports, "Hassan and IT and Health Services remain firm that the Academy's Wi-Fi does not present a health threat."

Meanwhile there have been around two dozen major international appeals for precaution against exposure to wireless radiation: <http://www.c4st.org/news/category/appeals-and-resolutions/> and <http://www.iemfa.org/appeals/>. The evidence I have referenced in my letter has convinced doctors, scientists, courts and even the European Parliament that a serious problem exists that needs to be addressed. The EU encourages member states to make institutions accessible to those who are affected by these new public exposures to microwave radiation. Again, the way to do this is to establish transmitter-free zones in public places and schools --i.e. adhere to the U.S. Access Board guidelines.

The Bioinitiative Report, which I have referenced throughout this paper, contains studies that link radiofrequency radiation to a host of ills including impaired fertility, cancer, ADHD and neurotransmitter diseases. Other specifics reported in the literature include leaching of calcium from cells, breach of the blood-brain barrier (the specific network of blood vessels that evolved to protect our brains from toxins), nephrotoxic effects/kidney damage, developmental effects, dizziness, tremors, decreased memory and attention, decreased reaction times and genotoxic effects in neurons, blood lymphocytes, hematopoietic tissue, lung cells and brain marrow. The total literature encompasses thousands of studies including epidemiological, human behavioral, in vitro and in vivo studies.

One of the things we learn as Exeter students is to distinguish between primary and secondary sources. When relying on the work of others, one must examine the process by which conclusions were reached and decide if the logic employed is supportable. The research process is KEY to figuring out what is FACT and what is FICTION. IT and Health Services and "the team of individuals across the Academy" to whom Fandrich refers relied on statements by others -- in this case, a large bureaucratic body with a tendency to wait decades to confirm the obvious, a conflict of interest problem, and contradictory statements ensuing from its various flanks over periods of time. Is the safety of students something to be outsourced to such a bureaucratic body? Has the school offloaded its liability because the WHO and the FCC say everything is okay? (Note: Insurance companies are declining to reinsure wireless risks: <http://www.takebackyourpower.net/news/2014/03/31/major-insurance-firm-swiss-re-warns-of-large-losses-from-unforeseen-consequences-of-wireless-technologies/>.) Will the ultimate costs be waived by Congressional indemnification and passed on to the American taxpayer? Will the State Attorneys General recoup health care costs from the wireless industry as they did with tobacco?

Is a device that emits radiation automatically safe if one stays below the threshold prescribed by a government agency (FCC) that outsources standard-setting to industry and that is currently headed by a former industry lobbyist and ex-telecom venture capitalist? (The lobbying arm he was head of underwrites the five o'clock news at CNN and sued the city of San Francisco over a law that would have

mandated disclosure at point of sale on how to reduce radiation exposure to the body). Is a public health crisis necessarily like the later stages of plague in Camus' *La Peste* (a former staple of the syllabus of one of the French 400 courses) where contagious people are overcome, spluttering in public -- doctors used to say that people weren't "dying in the streets" from cigarette smoking so it couldn't be that serious.... or does it resemble the earlier descriptors in the novel where people ignored the evidence of the impacted rats? The work of Margaritis and Fragopoulou (which should be part of the public conversation about the effects of wireless) that showed rodents unable to find their way out of a water maze (that they previously had been trained to exit) after being exposed to relatively short duration and so-called low-levels of wireless radiation, comes to mind: <http://kyttariki.biol.uoa.gr/EMR-GROUP/Fragopoulou-Margaritis-2010.pdf>. Scientists are known to use rats as a proxy for teenagers.

When one is at Exeter, the administration acts *in loco parentis* and historically, young adults aren't fully in charge of their own welfare until graduation from college and assumption of real world responsibilities. This generation of students is being thrust into a position where they must do their own research and question their authority figures earlier if they want to ensure their health and wellbeing. At the same time, there is a strong presumption that the standards and practices one grows up with are legitimate because some very important people in positions of authority wouldn't allow bad things to happen to society. These presumptive authority figures would include captains of industry, some doctors, and government officials like the President, who appeared with his FCC Chair/campaign bundler to champion Wi-Fi in schools. It is very difficult to overcome these deep-seated biases even though the evidence for harm is abundant. Notwithstanding learned dependence and comfort with the technology in use, I hope that students as well as parents, faculty, and administrators are compelled to take a hard look at the arguments against Wi-Fi, the evidence presented and what is going on in other countries.

At the end of the day, there are many reasons to be at a school with a reputation like Exeter's. These include practicing thinking: observing your surroundings, questioning, investigating, interpreting evidence, acknowledging the results and acting accordingly. I have posited that institutions across many sectors aren't doing their jobs properly. If *schools* fail to analyze their own decisions properly and short-circuit an enquiry that runs counter to their desired outcome, they are failing *twice* as institutions; first in their duty to protect the students, faculty and staff and second in their core educational mission.

Dr. Olle Johansson, PhD of the Karolinska Institute was quoted as saying, "Kick out politicians who give students hazardous e-readers with unproven educational value": <http://electromagnetichealth.org/wp-content/uploads/2014/03/Kick-out-politicians-who-give-students.pdf>. While the comment about the devices being hazardous is on point, few are calling for heads to roll as most are not educated enough about this problem to advocate for their children's interests. The plaintiffs in Israel's Wi-Fi case say the court is the only way to force their institutions to stop poisoning children. Hardell points out that even in Sweden where the government acknowledges that wireless technologies impair peoples' health, some parents demand iPads in daycares as an educational competitive advantage -- a perfect storm of addiction and denial. In the U.S. it is fed by an exceptionally powerful industry that provides the Treasury with more revenue than any other industry except for oil and gas and is permitted to self-regulate. I understand from faculty that the Exeter administration received pressure over time from prospective parents about "amenities." It's a vicious cycle, and one that requires leadership to break.

While a Waldorf school in the heart of Silicon Valley populated with the children of tech executives eschews all educational screen technology, http://www.nytimes.com/2011/10/23/technology/at-waldorf-school-in-silicon-valley-technology-can-wait.html?pagewanted=all&_r=1&, the question of computer use in schools is one of pedagogical philosophy; the imminent need is to hard-wire laptops, tablets, etc. The City of Lakes Waldorf School in Minneapolis not only removed Wi-Fi but adheres to the U.S. Access Board Guidelines by screening out passive Wi-Fi from entering the classroom windows via simple EMF-blocking curtains. This should be standard practice for all schools in the United States. (See photo on page 26 of the April issue of the Waldorf Schools magazine, *Renewal*, and accompanying articles: http://wifiinschools.com/uploads/3/0/4/2/3042232/waldorf_renewal_magazine_-_wifi.pdf.) It wouldn't be difficult for NAIS or other consortia to use their leverage to demand that vendors provide Ethernet accessibility and replacement infrastructure (wires).

There are ancillary issues; laptops emit other fields even when not connected to Wi-Fi so students should hard-dock them in their dorm rooms with a wired monitor, mouse, keyboard and printer to stay out of range of these emissions. Also, the administration should return the landlines to the dorms and teach students during orientation how to reduce exposure to all non-ionizing radiation e.g. by holding cell phones away from the head and body, using wired earpieces or speakerphone, not putting an iPod or other electronics against the body, using wired technologies indoors and only using wireless technologies when outdoors, etc.: <http://wirelessrighttoknow.com/ehs/tips/>.

Deborah E. Kopald '91
August 31, 2014

For further study about the issues raised in my letter, watch footage/listen to audio from the most recent US conferences covering wireless health hazards listed below (links included):

2010 San Francisco, CA Commonwealth Club Forum: The Health Effects of Electromagnetic Fields (Dr. Olle Johansson, Starling W. Childs, M.S., Dr. Magda Havas, Elizabeth Kelley, MA, Dr. Martin Blank, Dr. Joel Moskowitz, L. Lloyd Morgan, Camilla Rees, MBA, Sissel Halmoy, Dr. Sam Milham, Gabriel North Seymour, Esq.):
<http://electromagnetichealth.org/electromagnetic-health-blog/cc-video/>

2012 Washington, D.C. Building Biology Conference: Healthy Bodies, Healthy Buildings (Dr. Devra L. Davis, Dr. Lisa Nagy, Dr. Timothy Schoechle, James S. Turner, Esq., Duncan Campbell, Esq.):
<http://hbelc.org/keynote-crees> (Keynote)

2013 New York, NY Corporate Interference with Science and Health Conference (wireless speakers: Dr. David O. Carpenter, Dr. Lennart Hardell, Dr. Magda Havas, Representative Andrea Boland, Deborah E. Kopald, MBA and Whitney North Seymour, Jr. Esq.):
<http://www.corporateinterference.org/videos.html>

2013 New York, NY Open Center Forum: How to Protect Ourselves and Growing Children from Electromagnetic Fields (Dr. Stephen Sinatra, Larry Gust, BBEC, Dr. Martin Blank, Camilla Rees, MBA):
<http://electromagnetichealth.org/electromagnetic-health-blog/open-center-nov-15/>
<http://vimeo.com/81745337> (Event Audio)
<http://vimeo.com/81534630> (Gust slides with voiceover)

2014 San Francisco, CA Commonwealth Club Forum: The High Road to a True Smart Grid: (Dr. Timothy Schoechle, Duncan Campbell, Esq., Camilla Rees, MBA, James S. Turner, Esq., Dr. Karl Maret, MD, Eng.):
http://www.gettingsmarteraboutthesmartgrid.org/the_high_road_to_a_true_smart_grid_video