

Health Effects of EMR

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Notes on the Health Effects of Man-made Electromagnetic Frequencies (HEMEF)

Introduction [1]

The greatest environmental change wrought so far by the human species is the change in the electromagnetic environment of the earth. For billions of years the earth's electromagnetic environment was virtually "silent" in the range of the electromagnetic spectrum below visible light, and light itself was the most abundant source of electromagnetic energy. Now, in just a few decades, with the explosion of wireless signals of radio and TV broadcasts, radar, military applications, microwave towers and cell phones, and ever etcetera, the density of radio waves and microwaves in our environment is many millions of times higher than the natural levels with which all life on earth evolved. We have created and are living in a blanket of electrosmog never before experienced by living species, without having considered the consequences. What were we thinking?

Statements/Appeals by Informed Experts [2]

Public statements and appeals made by independent researchers & informed doctors, concerned about the health effects of exposure to electromagnetic radiation. In October 1998, at the University of Vienna Workshop on Possible Biological and Health Effects of Radio Frequency Electromagnetic Fields, [ref. 15] the following resolution was adopted by the participating scientists. (The Vienna Resolution):

Symptoms of high frequency illness [3]

The original symptoms list below was published in "No Place To Hide" Volume 3, Number 1, April 2001, "Special Issue on Russian and Ukrainian Research" by Arthur Firstenberg, Editor of The Cellular Phone Taskforce.

Research [4]

Understanding how living creatures are affected by manmade electromagnetic frequencies requires an understanding of biological processes that is as yet foreign to some scientists who still believe that biological processes are just chemical processes, when in fact our biochemical processes all involve electromagnetism.

Calcium Ion Efflux [5]

Dr. Blackman has conducted far more experiments in his laboratory on this influx/efflux than anyone else. They have shown that calcium ion alteration occurs at particular carrier frequencies, particular signal strengths, particular modulation frequencies and in particular temperature ranges, but not in others which lie between them.

Melatonin Reduction [5]

There are well established theoretical and observationally confirmed mechanisms for external ELF signals to be resonantly absorbed in human tissue, especially the brain and heart, and cause reduced melatonin. Melatonin is the most potent naturally produced antioxidant that helps to protect cells from genetic damage that leads to cancer, neurological, cardiac and reproductive damage, illness and death.

Occupational Studies [6]

Human Melatonin, and its urinary metabolite, decreases in relation to EMF exposure of electrical workers in substations or on 3-phase conductors more than 2-hours per day, electric train operators, office workers using Visual Display Units (computer monitors), and cellular telephone users who use the phone more than 25 minutes per day. (Burch, J. B. et al. 2000. Melatonin Metabolite Levels in Workers Exposed to 60-Hz Magnetic Fields: Work in Substations and with 3-Phase Conductors. *Occup Environ Med* 42:(2)2000 .)

Power Line Studies [6]

A British study conducted by Dennis Henshaw and colleagues at the University of Bristol, published in the

International Journal of Radiation Biology on February 14, 1996, found that power lines attract particles from radon gas, a known carcinogen. They have found evidence that the harmful concentrations of radon products may be present around overhead power lines. The electromagnetic fields associated with the lines can therefore concentrate a cocktail of potential carcinogens.

Cell Phone/Wireless Studies [7]

The biological affects of exposure to electromagnetic radiation, from wireless technology, is a worldwide problem. One quarter of the world's population is now exposing themselves to microwaves from hand-held mobile phones. The research team in Lundt University , Sweden , led by Leif Salford, referred to this as "the largest human biologic experiment ever". They point out that soon, microwaves will be emitted by an abundance of other appliances in the 'cordless' office and in the home.

Cordless Phones [8]

Cordless phones are a significant danger to health due to pulsed electromagnetic radiation. Cordless phones have for some reason been misperceived by the public as safer than cell phones, though in fact the frequencies used by new cordless phones are in the same microwave range used by cell phones. They have a number of features that makes them particularly dangerous.

Proximity to Communications Towers [8]

The health effects of living near wireless communications towers. A study done in France by Santini showed significant associations between symptoms fitting to the microwave sickness and the distance to mobile phone base stations. It should be noted that the health related symptoms were most frequently reported at a distance of 50 100 m, which fits perfectly to the area with the highest microwave exposure in urban areas, where the main beam of the antennas usually hits the first houses. The second study done in Austria showed significant positive associations between the frequency selective measured electric field (GSM 900/1800) in the bedroom and cardiovascular systems.

Politics in Research [8]

"Two of the world's leading radiation experts told The Express that multinational companies tried to influence the results of their research. Professor Ross Adey, a biologist, had his funding withdrawn by Motorola before completing research which showed that mobiles affected the number of brain tumours in animals. Dr. Henry Lai, who has been studying the biological effects of electromagnetic fields for 20 years, was asked three times to change findings on how they caused DNA breaks in rats." Express Newspapers 24 May, 1999

Corruption at the W.H.O. [9]

"Precautionary policies should not be applied to EMFs," states Dr. Michael Repacholi. (MWN, S/O 01). As reported in Microwave News, Mike Repacholi, the head of the WHO EMF project,"recruited utility representatives to help write the original draft of the WHO document recommending exposure levels, and later asked them to review the completed draft. Repacholi invited eight utility representatives to attend task group meeting — the only observers who were invited.

Safety Standards [10]

The Precautionary Principle indicates that, when there is plausible scientific evidence of significant harm from a proposed or ongoing activity, preventive or corrective action should be taken to reduce or eliminate that risk of harm, despite residual scientific uncertainty about cause and effect relationships. Although there is general agreement on the principle, humans to date have often failed dramatically in the practical application of it. As noted by Alasdair Phillips of Powerwatch,"History is filled with examples of "perfectly safe" environmental factors that later turned out to be harmful, if not disastrous...Even the American Medical Association (AMA) accepted tobacco advertising in its journals, with such statements as, "They won't harm anybody. They will prove enjoyable."

Electrical Pollution [11]

ELECTRICAL POLLUTION: health-damaging ELF frequencies we are exposed to due to the inappropriate design of

the 50/60 Hz electrical transmission and distribution systems. Low frequency electromagnetic fields, whose frequencies, harmonics and sub-harmonics coincide with the range of frequencies used by our brains, hearts and cells. Subtly and at extremely low intensities, they strongly interact, through resonant absorption, with primary functions of our bodies with significant elevations in depression, sickness and death. (Dr. Neil Cherry.)

Electrical Sensitivity [12]

ELECTRICAL SENSITIVITY: How the body reacts to manmade electromagnetic radiation, research and governmental response

“My working hypothesisis that electrohypersensitivity is a kind of irradiation damage, since the observed cellular changes are very much the same as the ones you would find in tissue subjected to UV-light or ionizing radiation.”
Prof. Olle Johansson

WiFi [13]

Hundreds of studies have already demonstrated the severely deleterious health effects of living near radio and microwave broadcast towers. Also, review the information on irrelevance of present SAR standards. The United States Environmental Protection Agency (EPA) itself acknowledges that current Federal Communications Commission (FCC) radiation protection standards are inadequate and do not account for all possible harmful effects of RFR, in particular the non-thermal effects that are of particular relevance to the radiation utilized by WiFi. In a July 16, 2002 letter from Norbert Hankin of the EPA's Center for Science and Risk Assessment, Radiation Protection Division to Janet Newton, President of The EMR Network, Mr. Hankin writes: “The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-Ionizing Radiation Protection, are thermally based, and do not apply to chronic, non-thermal exposure situations.”

INTRODUCTION

Overview and important terms

[“The greatest environmental change wrought so far by the human species is the change in the electromagnetic environment of the earth. For billions of years the earth's electromagnetic environment was virtually “silent” in the range of the electromagnetic spectrum below visible light, and light itself was the most abundant source of electromagnetic energy. Now, in just a few decades, with the explosion of wireless signals of radio and TV broadcasts, radar, military applications, microwave towers and cell phones, and ever etcetera, the density of radio waves and microwaves in our environment is many millions of times higher than the natural levels with which all life on earth evolved. In addition, the increased use of electronics by electricity consumers has resulted in a situation where our building wiring systems, intended to carry just 50 or 60 Hz, now broadcast harmful high frequencies as well. We have created and are living in a blanket of electrosmog never before experienced by living species, without having considered the consequences. What were we thinking?”

In order to understand what we should have been thinking about, we need to be familiar with a few terms and features of manmade electromagnetic energy.

Atoms are made up of negatively charged electrons that orbit around a positively charged nucleus. Electrons can move up in different orbits when they are excited, Their return to their original orbit releases energy. Electrons shaken loose and traveling through a wire produce electricity. Light, heat, electricity and nuclear activity are all forms of electromagnetic energy.

Energy moves away from its source in waves, and is classified according to the length of its wave. Utility-provided electricity of 60 Hz (Hertz) has 60 waves per second. Frequencies below 3 kHz (3 kilohertz, or 3 thousand Hertz, 3,000 waves per second) are called Extra Low Frequency (ELF) and are measured in terms of their electric and magnetic components.

The electric field is related to the voltage in the conductor. Electric fields are present even if no current is flowing. For instance, a plugged-in lamp and the cord to it have an electric field, even if the lamp is not turned on. Electric fields are measured in V/m, or volts per meter.

The magnetic field is generated by the current flowing through a conductor, and it varies in strength with the strength of the current. Magnetic field strength is measured in milliGauss (mG), which is 1/1000 of a Gauss. Another unit of measure for magnetic field strength is the microtesla, μT . One μT equals 10 mG.

The lower the frequency, the longer the wavelength. The higher the frequency, the shorter the wavelength. The shorter the wave, the more power is inherent in it.

As we move up the EM spectrum from the longer to the shorter wavelengths, we encounter first electrical power transmission, then radio, TV, radar/microwave, radiant heat/visible light, ultraviolet, x-rays and gamma rays. The frequencies at and below that of visible light are known as non-ionizing, and those above light as ionizing. At ionizing frequencies, the particles of radiation contain enough energy to eject electrons from atoms and molecules, leaving them electrically imbalanced, or ionized. Ionized molecules are highly reactive and can damage cells.

As technology advanced and we began to use the higher frequencies, it was accidentally discovered that frequencies of about 27MHz (27 mega Hertz, or 27 million cycles per second) caused body heating. It was inaccurately concluded that any biological effects not caused by ionization must be caused solely by overheating. Thus the first safety standard set for exposure to manmade electromagnetic energy took only heating into consideration, relying mostly on the work of Herman Schwan, a biophysicist. In the 1950s, Schwan worked for the Defense Department, estimating "safety" according to how much radar MW energy it took to heat metal balls and containers of salt water, which he believed represented both the size and electrical characteristics of animals and humans.

Operating on the assumption that in regards to non-ionizing radiation avoiding heating meant safety, with heating occurring at 100mW/cm², the Air Force applied a "safety factor" of ten and set an initial safety standard of 10mW/cm² (10 milliwatts of energy absorbed in a square centimeter of tissue) in 1957. Later standard setters, influenced ever more strongly by industry and the military, ignored the emergence of evidence that biological effects were indeed occurring at levels far below 10mW/cm², and in 1966 the American National Standards Institute (ANSI) developed ANSI C95.1-1966 at 10mW/cm². The rewritten ANSI/IEEE C95.1-1992 set a two-tiered recommendation, one for the general public and one for RF workers, and lowered the limit to some frequencies to 1 mW/cm², but the standard still presumes only thermal effects, in the face of now monumental evidence to the contrary. The EPA called this standard seriously flawed and specifically cited the failure to recognize nonthermal effects. Nonetheless, it remains in effect.

In a July 16, 2002 letter from Norbert Hankin of the EPA's Center for Science and Risk Assessment, Radiation Protection Division to Janet Newton, President of The EMR Network, Mr. Hankin writes: " The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-Ionizing Radiation Protection, are thermally based, and do not apply to chronic, nonthermal exposure situations." — Shivani]

STATEMENTS/APPEALS BY INFORMED EXPERTS:

Public statements and appeals made by independent researchers & informed doctors, concerned about the health effects of exposure to electromagnetic radiation.

In October 1998, at the University of Vienna Workshop on Possible Biological and Health Effects of Radio Frequency Electromagnetic Fields, [ref. 15] the following resolution was adopted by the participating scientists. (The Vienna Resolution):

“The participants agreed that biological effects from low-intensity exposures are scientifically established. However, the current state of scientific consensus is inadequate to derive reliable exposure standards. The existing evidence demands an increase in the research efforts on possible health impact and on adequate exposure and dose assessment.”

In his summary report, Dr. Cherry concludes: “Scientific studies at the cellular level, whole animal level and involving human populations, show compelling and comprehensive evidence that RF/MW exposure down to very low levels, levels which are a minute fraction of present “safety standards”, result in altered brain function, sleep disruption, depression, chronic fatigue, headache, impaired memory and learning, adverse reproductive outcomes including miscarriage, still birth, cot death, prematurity and birth deformities. Many other adverse health effects have been found, predominantly cancer of many organs, especially brain cancer, leukemia, breast cancer and testicular cancer. Studies have also found that RF/MW exposed parents have more children with CNS cancers and other health defects. These effects are consistent with genetic damage caused by RF/MW. Many scientific studies have found chromosome aberrations and DNA damage with RF/MW exposure, the first being published in 1959. Two primary biological mechanisms are linked to these effects, calcium ion efflux and melatonin reduction. With melatonin reduction, there is a rise in serotonin, which is associated with awakeness, alertness, anxiety, anger, rage and violence depending on the serotonin level, the person and the circumstances.

Hence, there is strong evidence that ELF and RF/MW is associated with accelerated aging (enhanced cell death and cancer) and moods, depression, suicide, anger, rage and violence , primarily through alteration of cellular calcium ions and the melatonin/serotonin balance.”

As reported at: EMF Issues

“More than 100 epidemiological studies have shown an association between residential and occupational EMF exposure and many types of cancer. The association between EMF exposure and childhood cancer is especially strong. This scientific evidence led the 28 member panel convened by the National Institute of Environmental Health Sciences (NIEHS) to conclude on July 24, 1998, that extremely low frequency (ELF) electromagnetic fields should be regarded as possible carcinogens. The final vote of the panel was 19 to 9 in favor of categorizing ELF EMFs, such as those from power lines and electrical appliances, as possible carcinogens. The vote followed a year of exhaustive evaluation of the scientific literature, three multi-day symposia attended by many international scientists, and a final 10 day review and debate of the scientific and medical literature in a closed meeting in Minnesota.”

The Salzburg Resolution signed by 19 scientists and public health doctors from 10 countries, was the outcome of the first international conference dedicated to public health issues connected with exposure to Base-station emissions, which was held in Salzburg in June 2000. The Salzburg Resolution recommends that outdoor exposure should be below 1mW/m² (0.1µW/cm²) . – equivalent to an electric field of 0.6 volts per metre (V/m) – in publicly accessible areas surrounding such an installation. It should be noted that this value is 4500(9000) times lower than the ICNIRP Guideline value for 900(1800)MHz radiation.

The Catania Resolution signed by 16 eminent scientists of international standing from 7 different countries, following a conference in Sicily in September 2002 states: “Epidemiological and in vivo and in vitro experimental evidence demonstrates the existence for electromagnetic field induced effects.which can be adverse health. .. ‘The weight of evidence calls for preventive strategies based on the Precautionary Principle.”

The Freiburger Appeal

In October 2002 a team of over 50 German medical doctors started the Freiburger Appeal. After seeing a dramatic rise in severe and chronic diseases, they have noted a clear temporal and spatial correlation between disease and exposure to microwave radiation. The appeal has since been signed by thousands of doctors. To quote:

“Out of great concern for the health of our fellow human beings do we – as established physicians of all fields,

especially that of environmental medicine – turn to the medical establishment and those in public health and political domains, as well as to the public. We have observed, in recent years, a dramatic rise in severe and chronic diseases among our patients, especially:

- * Learning, concentration, and behavioural disorders (e.g. attention deficit disorder, ADD)
- * Extreme fluctuations in blood pressure, ever harder to influence with medications
- * Heart rhythm disorders
- * Heart attacks and strokes among an increasingly younger population
- * Brain-degenerative diseases (e.g. Alzheimer's) and epilepsy
- * Cancerous afflictions: leukemia, brain tumors

Moreover, we have observed an ever-increasing occurrence of various disorders, often misdiagnosed in patients as psychosomatic:

- * Headaches, migraines
- * Chronic exhaustion
- * Inner agitation
- * Sleeplessness, daytime sleepiness
- * Tinnitus
- * Susceptibility to infection
- * Nervous and connective tissue pains, for which the usual causes do not explain even the most conspicuous symptoms

Since the living environment and lifestyles of our patients are familiar to us, we can see (especially after carefully-directed inquiry) a clear temporal and spatial correlation between the appearance of disease and exposure to pulsed high-frequency microwave radiation (HFMR), such as:

- * Installation of a mobile telephone sending station in the near vicinity
- * Intensive mobile telephone use
- * Installation of a digital cordless (DECT) telephone at home or in the neighbourhood

We can no longer believe this to be purely coincidence, for:

- * Too often do we observe a marked concentration of particular illnesses in correspondingly HFMR-polluted areas or apartments;
- * Too often does a long-term disease or affliction improve or disappear in a relatively short time after reduction or elimination of HFMR pollution in the patient's environment;
- * Too often are our observations confirmed by on-site measurements of HFMR of unusual intensity.

On the basis of our daily experiences, we hold the current mobile communications technology (introduced in 1992 and since then globally extensive) and cordless digital telephones (DECT standard) to be among the fundamental triggers for this fatal development.

One can no longer evade these pulsed microwaves. They heighten the risk of already-present chemical/physical influences, stress the body's immune system, and can bring the body's still-functioning regulatory mechanisms to a halt. Pregnant women, children, adolescents, elderly and sick people are especially at risk.

Our therapeutic efforts to restore health are becoming increasingly less effective: the unimpeded and continuous penetration of radiation into living and working areas (particularly bedrooms, an essential place for relaxation, regeneration and healing) causes uninterrupted stress and prevents the patient's thorough recovery.

In the face of this disquieting development, we feel obliged to inform the public of our observations, especially since hearing that the German courts regard any danger from mobile telephone radiation as "purely hypothetical." (See

the decisions of the constitutional court in Karlsruhe and the administrative court in Mannheim , Spring 2002). What we experience in the daily reality of our medical practice is anything but hypothetical!

We see the rising number of chronically sick patients also as the result of an irresponsible “safety limits” policy, which fails to take the protection of the public from the short- and long-term effects of mobile telephone radiation as its criterium for action. Instead, it submits to the dictates of a technology already long recognized as dangerous.

For us, this is the beginning of a very serious development through which the health of many people is being threatened.

We will no longer be made to wait upon further unreal research results – which in our experience are often influenced by the communications industry – while evidential studies go on being ignored. We find it to be of urgent necessity that we act now!

Above all, we are, as doctors, the advocates for our patients. In the interest of all those concerned, whose basic right to life and freedom from bodily harm is currently being put at stake, we appeal to those in the spheres of politics and public health.

Please support the following demands with your influence:

* New health-friendly communications techniques, given independent risk assessments before their introduction and, as immediate measures and transitional steps:

* Stricter safety limits and major reduction of sender output and HFMR pollution on a justifiable scale, especially in areas of sleep and convalescence

* A say on the part of local citizens and communities regarding the placing of antennae (which in a democracy should be taken for granted)

* Education of the public, especially of mobile telephone users, regarding the health risks of electromagnetic fields

* Ban on mobile telephone use by small children, and restrictions on use by adolescents

* Ban on mobile telephone use and digital cordless (DECT) telephones in preschools, schools, hospitals, nursing homes, events halls, public buildings and vehicles (as with the ban on smoking)

* Mobile telephone and HFMR-free zones (as with auto-free areas)

* Revision of DECT standards for cordless telephones with the goal of reducing radiation intensity and limiting actual use time, as well as avoiding the biologically critical HFMR pulsation

* Industry-independent research, finally with the inclusion of amply available critical research results and our medical observations

The Helsinki Appeal 2005 from EMF Team Finland calls on the European Parliament to act promptly for the adoption of the new safety standard in the European Union. Physicians and researchers feel great concern about the Precautionary Principle not being sufficiently applied to electromagnetic fields. They want the standards recommended by ICNIRP to be rejected, because recent scientific studies report various disturbances caused by mobile phone and other RF radiation.

The European Parliament Resolution B3-0280/92, clauses D and E, bases its concern on the matter of EMF health effects, in part, on recognition that the cell membrane is the primary site of cellular interaction of EMF and living tissues:

D. whereas, according to an increasing number of epidemiological and experimental studies, even slight exposure to non-ionizing electromagnetic fields increases the risk of cancer, can be accompanied by nervous disorders and disruption of the circadian rhythm and seems capable of affecting developing organisms,

E. whereas the results of many in vivo and in vitro studies show increasingly clearly the interaction mechanisms

underlying such disorders and illnesses, centered mainly in the cell membrane, lead to disruption of melatonin secretions, ornithine decarboxylase activity and T-lymphocyte efficacy, testifying to the probable role of non-ionizing radiation in promoting cancer.

[The utility industry's latest strategy is to argue that we cannot prove that there is a health risk from electromagnetic fields until we know exactly how they cause cancer, leukemia or other diseases. This is a false argument as Paul Brodeur clearly points out in his 1993 book "The Great Power-Line Cover-Up" — Shivani]

"What industry spokespeople conveniently overlooked, of course, was that thirty years after definitive epidemiology had been conducted to show that asbestos was a potent cancer-producing agent, scientists still do not know the mechanism by which an inhaled asbestos fiber reacts in lung tissue to cause cancer. Nor do they understand the mechanism by which cigarette smoke reacts in lung tissue to cause cancer. Or how the chemical pesticide DDT operates in breast tissue to cause breast cancer. Suffice it to say, if public health authorities had been required to wait for the cancer-producing mechanisms of these agents to be fully understood, regulations governing asbestos exposure would not have been implemented; warnings on cigarette smoking would not have been issued; and the twenty-year old ban on DDT would not have been imposed."

[Now, of course, we have a number of studies that reveal mechanisms. Yet the illogical and immoral "lack-of-proof" argument is still being used, and both the public and medical doctors continue to docilely accept it. Rather than industry having to prove that a product or technology is safe before rolling it out, others have to prove that it is not, after many have already been irreversibly damaged by it. —Shivani]

COGHILL'S CHALLENGE online

To the UK electrical power utilities and the National Radiological Protection Board

This challenge was first thrown down in 1999. We have had not one single person daring to take it up and thereby win a thousand pounds. In June 2003 I doubled the stakes! First take a look at our studies on sudden infant death syndrome, ME, and on childhood leukaemia (see Our Research section). The overall chance of selection bias in these studies is minimal.

NRPB investigation levels advise 12,000 Volts per metre at ELF frequencies at the level where investigation becomes necessary to see if the field is strong enough to inflict adverse health effects from burning. Below this level no special precautions are necessary, they say. Power utilities around the world hide behind this advice (in some countries the level is only 5000 Volts per metre, (in Russia it is 500 Volts per metre, but these are still much higher than the levels found adverse in our study), and the utilities broadly deny that non-thermal effects from Electric field exposures below 5000 Volts per metre could be hazardous.

But my studies (inter alia) have shown that people sleeping in bedplaces where the ELF electric field is elevated above normal levels (say above 20 Volts per metre) there is serious ill health from chronic exposure (asthenias and leukaemias in adults, cot death in children). Therefore The £2000 (\$3,000) Coghill Challenge to power utility workers and the NRPB is:

Place any human infant of less than three months age to sleep each night for at least eight hours in an ELF electric field of 100 Volts per metre for thirty days. My studies predict that child will die, or become so seriously ill that the test will have to be called off. The NRPB and the power utilities' investigation levels by contrast predict there will be no adverse effect.

I will personally bet any NRPB member of staff or any electric power utility worker around the world £2000 (or US\$3000) willing to do this experiment, that my prediction will prove correct.

Only one £2000 payment will be made so first come, first served.

Only power worker employees and NRPB staff employee parents are eligible for the Coghill Challenge.

This challenge was originally mounted on 4 July 1999, and was extended as from 4 July 2003. Come and get the cash, guys!

Entrants must agree that we will let visitors to our website know the results of this trial, with the outcome verified by the coroner or doctor attending the infant.

SYMPTOMS OF ELECTROMAGNETIC HIGH FREQUENCY ILLNESS

The original symptoms list below was published in "No Place To Hide" Volume 3, Number 1, April 2001, "Special Issue on Russian and Ukrainian Research" by Arthur Firstenberg, Editor of The Cellular Phone Taskforce.

Symptoms of radio wave sickness

Neurological : headaches, dizziness, nausea, difficulty concentrating, memory loss, irritability, depression, anxiety, insomnia, fatigue, weakness, tremors, muscle spasms, numbness, tingling, altered reflexes, muscle and joint pain, leg/foot pain, "Flu-like" symptoms, fever. More severe reactions can include seizures, paralysis, psychosis and stroke. [Possibly MS as well.]

Cardiac : palpitations, arrhythmias, pain or pressure in the chest, low or high blood pressure, slow or fast heart rate, shortness of breath.

Respiratory : sinusitis, bronchitis, pneumonia, asthma.

Dermatological: skin rash, itching, burning, facial flushing.

Ophthalmologic : pain or burning in the eyes, pressure in/behind the eyes, deteriorating vision, floaters, cataracts.

Others : digestive problems; abdominal pain; enlarged thyroid, testicular/ovarian pain; dryness of lips, tongue, mouth, eyes; great thirst; dehydration; nosebleeds; internal bleeding; altered sugar metabolism; immune abnormalities; redistribution of metals within the body; hair loss; pain in the teeth; deteriorating fillings; impaired sense of smell; ringing in the ears. [Also leukemia, cancer, Lou Gehrig's Disease....]

Common sources of radio waves

Outdoors: Broadcast antennas (fixed); broadcast antennas (mobile); radar stations (fixed); radar devices (mobile); television cables; satellites; satellite receiving dishes; satellite sending dishes; cell phones, pagers, two-way radios.

Indoors: Cordless telephone base units; cordless telephones; wireless computers and their base units; wired computers; televisions; microwave ovens; dimmer switches; security systems; remote controls; fax machines, answering machines, CD players and other digital equipment; (in automobiles) ignition systems; (in theaters) assistive listening systems and devices for the hearing impaired; (in theaters) wireless microphones. [Also variable speed motors, transformers, wireless-broadcasting Palm Pilots, child monitors, some electronic games, high-frequency pest-repelling units, fish finders...]

[For many people, the main source of high frequencies is the electrical pollution riding on the 60-cycle current delivered by the electric utility company. RF currents also enter your home via water and gas pipes, phone lines, etc. Once inside, they tend to flow across surfaces, even of things like wooden furniture. Unless you check with a sensitive high-frequency electric field meter, you will not be aware of their presence and they may cause the above symptoms. —Shivani]

RESEARCH [1]

on the health effects of manmade electromagnetic frequencies

Understanding how living creatures are affected by manmade electromagnetic frequencies requires an understanding of biological processes that is as yet foreign to some scientists who still believe that biological processes are just chemical processes, when in fact our biochemical processes all involve electromagnetism. Each cell of living biological tissue is surrounded by a conductive medium containing charged particles that are free to change their position relative to the cell when exposed to outside electromagnetic influences. Within, cells contain numerous molecules, which also have electrical properties and are highly responsive to electrical stimuli. This natural arrangement results in the ability of living tissue to amplify or dampen the effects of external oscillating electromagnetic frequencies.Exogenous RF/MW fields can induce in the body electrical fields that are orders of magnitude higher than a body's own natural endogenous fields.

The studies mentioned here are just a few of thousands showing the detrimental effects of manmade electromagnetic radiation on humans and other species of living beings.

In 1981, Dr. Adey reported that "there is unequivocal experimental evidence that fields from ELF to UHF (10 Hz to 450 MHz) interact directly with brain tissue". Adey WR, 1981. "Tissue interactions with non-ionizing electromagnetic fields". *Physiological Reviews* 61

In 1987, Dr. Henry Lai and his team at the University of Washington speculated that biological responses are in effect stress responses. They found the effects of MW EMF similar to those of two known stressors: loud noise and body restraint. (Lai H Horita A Chou CK and Guy AW, 1987. "A review of microwave irradiation and actions of psychoactive drugs". *IEEE Engineering in Medicine and Biology Magazine*, March 1987)

In 1989 Dr. Reba Goodman and her team at Columbia University observed the synthesis of proteins called heat shock or stress proteins following exposure to EMFs. Stress proteins are formed as a result of exposure to stressors, including heat shock, ionizing radiation, infections, chemical toxins, etcetera.

Lindstrom et al. replicated and extended the research of other scientists and showed, that oscillating low level EMFs produce the same calcium ion reaction as does an antibody. (Lindstrom et al, 1995. "Intracellular calcium oscillations in a T-cell line after exposure to extremely-low-frequency magnetic fields with variable frequencies and flux densities". *Bioelectromagnetics* 16)

In 1998 it was shown that 60 Hz EMFs trigger a cascade of enzyme-driven cell-signaling events that could result in cancer. (Uckun F et al, 1998. "Stimulation of Src family protein-tyrosine kinases as a proximal and mandatory step for SYK kinase-dependent phospholipase Cy2 activation in lymphoma B cells exposed to low energy electromagnetic fields". *The Journal of Biological Chemistry*, Vol. 273, No. 7: 4035-4039)

Dr. Joan Farrell of the Catholic University of America in Washington, D.C has discovered that ELF fields induce an electric field in body tissue that may become amplified by orders of magnitude relative to the exogenous field. This signal enhancement mechanism offers some understanding regarding how ELF fields induce biological effects.

EMF exposure can alter heart rhythms and may lead to elevated cardiac risks, according to Dr. Antonio Sastre of the Midwest Research Institute in Kansas City, MO, as reported in *Microwave News*.

"A living body has special electromagnetic sensitivities precisely because of its aliveness.The possibility of a non-thermal influence arises because a living system itself supports a variety of oscillatory electrical/ biochemical activities, each characterized by a specific frequency, some of which happen to be close to those found in the [RF/MW] signals – a coincidence that makes these bioactivities potentially vulnerable to being interfered with in various (non-thermal) ways.

Unlike the heating effect of exposure to microwaves, which can, if excessive, cause actual material damage, non-thermal influences act in a more subtle way, via their potentiality to interfere with biological functionality – in particular....with that of bioprocesses which are intended to afford (natural) protection against adverse health effects

of various kinds.” (“How Exposure to GSM & TETRA Base-station Radiation can Adversely Affect Humans”, by G J Hyland, Associate Fellow Executive Member, Department of Physics, International Institute of Biophysics, University of Warwick, UK Neuss-Holzheim, Germany.

THE REFLEX PROJECT (Risk Evaluation of Potential Environmental Hazards from Low Energy Electromagnetic Field Exposure Using Sensitive in vitro Methods), was a 3-year joint research project set up to investigate the effects of low-levels of RF radiation on cellular systems; cost of approximately \$3 million. The work was carried out by 12 research groups in seven European countries. 1800 in vitro experiments were performed. Yet again it was shown RF radiation could increase the number of DNA breaks in exposed cells and could also activate a stress response – the production of heat shock proteins. It was clear chromosome damage could be seen in the cell exposed to mobile phone radiation over 24 hours exposure. [You can see an actual image of the cell damage on Dr Gerd Oberfeld’s Westminster Presentation on www.radiationresearch.org If you don’t see it there, I can e-mail you the file. —Shivani]

In 1994, Henry Lai and Narendra Singh from the University of Washington found that two hours of radiation at levels considered safe by government damaged rat-brain DNA....

In 1996 Lai & Singh showed single and double DNA strand breaks in brain cells of rats exposed to 2.45GHz SARs of 1.2 W/Kg (comparable with levels in the heads of mobile phone users).

CALCIUM ION EFFLUX / MELATONIN REDUCTION

on the health effects of manmade electromagnetic frequencies

A international scientific workshop on possible biological and health effects of RF electromagnetic fields, attended by international scientists, was held in Vienna in 1998.

The following are excerpts from Dr. Neil Cherry’s remarks about the conference, from an interview with Dorothy Hunt, M.A. F.T.C.L. titled “Cellphones – A Boon To Modern Society Or A Threat To Human Health?” which can be read at <http://www.nzine.co.nz/features/neilcherry3.html/>

Calcium ion efflux Caused by electromagnetic radiation, and its biological effects

“Dr. Blackman has conducted far more experiments in his laboratory on this influx/efflux than anyone else. They have shown that calcium ion alteration occurs at particular carrier frequencies, particular signal strengths, particular modulation frequencies and in particular temperature ranges, but not in others which lie between them.”

After summarizing these hundreds of experiments Carl Blackman stated that EMR must be treated as chemicals (plural) because we have made the mistake of treating it as a single chemical looking for single effects across the whole spectrum, when it is clear that the effects are very significant and occur at particular combinations of variables, but do not occur at a nearby different combination.

He finished by stating that it is very well established that there is a biological effect called calcium ion efflux and influx that can be caused by EMR at levels that are not involving heating but involving a frequency which has nothing to do with the energy levels. This is therefore a true biological effect, not a consequence of heat but produced by particular combinations of EMR and thus is a separate biological change.”

According to Dr Blackman’s data on calcium ion changes . damage appears to depend on a particular choice of the nature of the signal in the carrier frequency, the modulation characteristic, and the intensity of the signal.

Many researchers in the military and industrial laboratories take the attitude that if there is going to be an effect then it must be visible when high levels of energy are really pumped in. The science says that with EMR it is not necessarily an effect that occurs at a higher level and a higher energy.

Calcium ion influx/efflux is a mechanism for brain change which affects behaviour and reaction times in people and is therefore indicative of a human health effect.

Calcium ions in cells play a role in the growth and development of cells in DNA synthesis and in the life and death of cells. Therefore calcium ion alteration of cells by EMR is a biological mechanism linking to neurological degeneration such as Alzheimer's and other neurological diseases of age, to cancer and many other health effects. The scary aspect of this is that calcium ion efflux occurs at intensities and field strengths that are extremely low.

The heart is also an electromagnetic organ with an electric pulse initiating a cascade of calcium ions that cause the cells in the heart to contract and produce a heart beat every second or so throughout our lives. This is monitored by the electrocardiogram (ECG).

Melatonin reduction: Caused by electromagnetic radiation, and its biological effects

There are well established theoretical and observationally confirmed mechanisms for external ELF signals to be resonantly absorbed in human tissue, especially the brain and heart, and cause reduced melatonin. Melatonin is the most potent naturally produced antioxidant that helps to protect cells from genetic damage that leads to cancer, neurological, cardiac and reproductive damage, illness and death.

Melatonin levels also affect the health of the immune system that also has a vital role in trying to maintain health. Since a damaged cell should be eliminated by programmed cell death, apoptosis, or by natural killer cells in the immune system, altered calcium ions negatively affect both of these processes. Calcium ion influx inhibits apoptosis and calcium ion efflux enhances apoptosis, Fanelli et al. (1999).

Substances that reduce melatonin are genotoxic because of the reduced antioxidant effect allowing free radicals to cause more genetic damage. Direct evidence of genotoxicity comes from observed chromosome aberrations (CAs) and DNA strand breakage assays.

The very young and the very old have very low levels of melatonin. Melatonin production is very low at birth, peaks in early childhood and declines from puberty onwards.

A life-time of cumulative exposures to toxins and the reduced immune system, reduced sleep and reduced melatonin all lead to increased cancer risk, especially for those over 50 years of age, Milham and Osslander state that worldwide occurrence of a peak of childhood leukaemia follows the introduction of electrification.

75% of childhood cALL and 60 % of all childhood leukaemia may be preventable."

The historical rise in childhood leukaemia is paralleled by the same exponential rises in adult leukaemia in all developed countries. Reduced melatonin from 50/60 Hz EMF exposure is the core biological mechanism.

Childhood cancer rates are typically highest in the 0-4 yrs age group . The mother's melatonin passes through the placenta to the fetus in her womb regulating the daily cycle of the fetus and protecting the fetus from oxidative free radical damage. Reducing mother's nocturnal melatonin will increase the risk of fetal genetic and immune system damage.

Cancer develops in three main stages, initiation, promotion and progression, Weinstein (1988). Cancer development usually takes decades. In very young children the cancer development rate is much faster because their cell cycle is much quicker, their immune system is undeveloped and their melatonin production is very low. Cancer can be initiated in the fetus in utero. This is likely to be the case for early childhood ALL and AML. The promotion phase can commence in utero and continue after birth if the exposure to the toxic agent continues. For EMF it does. The rapid cancer development produces some leukaemia case in the 1 st year of life, with the rate continuing to rise to peak in years 3 to 4.

Milham and Ossiander link the early childhood cALL peak to electromagnetic fields of less than 1 mG in homes.

The simplest approach to cancer prevention is to avoid exposure to causative agents,

The present strongest block is the attitude of authorities that continue to deny the existence of the strong causative relationship between EMF and childhood and adult cancer so that preventative measures that are available are not applied. Hence the avoidable illness and death, that has grown and continued for over 90 years, continues to damage and kill innocent and valuable people.

There are over 70 studies showing that EMR across the spectrum increases the incidence of brain tumour ,

[end conference notes]

Scientists at the Cancer Therapy and Research Centre in San Antonio discovered that human cancer cells exposed to 60 Hz fields (the frequency of a high-voltage line) grew as much as 24 times as fast as unexposed cells and showed “greatly increased resistance to destruction by the cells of the body’s defense system.” [Do you know any cancer patient who has ever been told this? Or of a breast cancer sufferer who has been told that EMFs stop Tamoxifen from working, as seven studies have demonstrated? —Shivani]

There is evidence that breast cancer tumors absorb significantly more EMR than other cancers, or healthy tissue. To quote from one study, conducted at Duke University, North Carolina, USA, in 1993:

“In general, at all frequencies tested [50 to 900 MHz], both conductivity and relative permittivity were greater in malignant tissue than in normal tissue of the same type. For tissues of the same type, the differences in electrical properties from normal to malignant were least for kidney (about 6% and 4% average differences over the frequency range in permittivity and conductivity, respectively), and these differences were the greatest for mammary gland (about 233% and 577% average differences in permittivity and conductivity, respectively).

The ability of breast cancer tumors to absorb significantly more EMR than normal tissue should be of concern.”

[Note that under-wire bras, dental appliances, glasses frames, or any other metal in or worn on the body, serves as a “slave antenna” to broadcast radiation into the body when one uses a wireless or cell phone, or is exposed to a wireless signal. —Shivani]

“In England, intensities of electric fields were significantly higher, 13.6 V/m in the bed places of children diagnosed with leukemia, than for controls 7.26 V/m, with chronic night time exposure above 20 V/m giving a five fold increased risk of leukemia.” Coghill, Roger. 1996. “A Case-Control Study of Electric and Magnetic Fields in the Bedplace of Children Diagnosed with Leukaemia”. England, *Biophysics* 41:806-816 (1996) and the *European Journal of Cancer Prevention* 5:3-10 (1996) .

OCCUPATIONAL/POWER LINE STUDIES

on the health effects of manmade electromagnetic frequencies

Occupational Studies

Risks associated with electromagnetic radiation in the workplace

Human Melatonin, and its urinary metabolite, decreases in relation to EMF exposure of electrical workers in substations or on 3-phase conductors more than 2-hours per day, electric train operators, office workers using Visual Display Units (computer monitors), and cellular telephone users who use the phone more than 25 minutes per day. (Burch, J. B. et al. 2000. “Melatonin Metabolite Levels in Workers Exposed to 60-Hz Magnetic Fields: Work in Substations and with 3-Phase Conductors”. *Occup Envir Med* 42:(2)2000 .)

Savitz et. al., (1999) found crude dose-responses for Cardiac Arrythmia related heart disease in U.S. utility workers

exposed to measured 60 Hz magnetic fields They also observed a significant linear dose-response in heart attack mortality. [I doubt strongly that the researchers checked the current for high frequencies. Absolute correspondence with high frequencies was found when other older research was re-examined.—Shivani]

Sobel et. al., have found that when they adjusted for many other compensating factors there is close to a five times increased risk of Alzheimer's for workers working in electromagnetic radiation fields in electrical industries. In a later paper in the journal [Neurology] they present a hypothesis about the mechanism through which there is increased production of a substance called amyloid beta, a fact known to be associated with Alzheimer's disease. They investigated how electromagnetic fields might well enhance the production of that substance. The first step in this process is calcium ion efflux from the cells. This means that there is a mechanism and epidemiology – which is true of so many health effects in this area.

Paul Demers, working with Dr. David Thomas's research group at the Hutchinson center, has found that telephone linemen, electricians and electric power workers have six times the expected rate of male breast cancer – a statistically significant increase. For radio and communications workers, the risk was almost tripled. Overall there was a doubling of the cancer risk for all EMF-exposed workers.

Dr. Gilles Theriault of Montreal's McGill University found that workers with above-average exposure to magnetic fields were three times more likely to develop acute myeloid leukemia than less-exposed workers. Acute myeloid leukemia is one of the most common types of leukemia among adults.

A University of North Carolina School of Public Health study conducted by Dr. David Savitz and Dr. Dana P. Loomis published in January 1995 in the American Journal of Epidemiology found that utility workers have a greater chance of dying of brain cancer. The results demonstrated that workers with the highest EMF exposures had more than a two-and-a-half times greater chance of dying of brain cancer than the least exposed workers. The researchers also observed a strong exposure-response relationship for brain tumours.

A 1996 study of cancer among hydro workers by researchers at the University of Toronto suggests that exposure to electric fields could be carcinogenic. Previous studies have focused on the magnetic fields. The study, led by Dr. Anthony Miller, chair of preventive medicine and biostatistics at U of T, covered more than 30,000 current, former and retired Ontario Hydro workers and found an increased risk of leukemia in association with increased exposure to both electric and magnetic fields. However, the researchers concluded that the electric field effect is dominant.

The study found that the risk of leukemia in the highest electric field exposure level, was four times that of the lowest. In certain subcategories where workers had high exposure to magnetic and electric fields, researchers found leukemia rates 11 times greater than rates among the general worker population.

Dr. Stanislaw Szmigielski, a leading epidemiologist with the Centre for Radiobiology and Radiation Safety at the Military Institute of Hygiene and Epidemiology, Warsaw, Poland has been the team leader for an on-going study of the health effects of RF/MW exposure of military personnel in Poland for the whole military population. His research found that young military personnel exposed to RF/MW radiation had more than eight times the expected rate of leukaemia and lymphoma. Careful surveys of exposure revealed that 80 – 85% of the personnel were exposed to an average of less than 42 microwatts/sq. cm., with a median point near 7 microwatts/sq. cm.

Power Line Studies

The health effects of living/working near power transmission lines

A British study conducted by Dennis Henshaw and colleagues at the University of Bristol, published in the International Journal of Radiation Biology on February 14, 1996, found that power lines attract particles from radon gas, a known carcinogen. They have found evidence that the harmful concentrations of radon products may be present around overhead power lines. The electromagnetic fields associated with the lines can therefore concentrate a cocktail of potential carcinogens.

On November 28, 1999, The Sunday Times reported on a new study by Professor Henshaw to be published in the International Journal of Radiation Biology. The study confirms that people living near them are exposed to radiation levels dozens of times greater than the legal limit.

The research firmly links the power lines with childhood leukaemia and other forms of cancer. ...In some areas children living near power lines could receive doses of 95 millisieverts of radiation a year, compared with the maximum for homes of one millisievert. Nuclear workers are allowed a maximum dose of 50, soon to be reduced to 20.

The effect of the fields can extend more than 100 yards either side of the lines. [The airborne radioactive ions, however, travel with the prevailing wind. As Dr. Henshaw has found, they are charged particles and thus adhere to lung tissue. —Shivani]

An article in the May 12, 1997 New Zealand Herald reports that New Zealand researchers have linked high-tension power lines – already associated with higher rates of leukemia among children – to asthma and depression in adults. The ground-breaking research suggests that people living within 20m of high-voltage lines are three times as likely to suffer from asthma and twice as likely to have major depression. The study also indicates that these people have a higher incidence of diabetes and are twice as likely to suffer from immune-related illnesses such as allergies and dermatitis.

From www.electric-fields.bris.ac.uk/PressRelease.htm

“A particularly important finding from Dr Draper’s work is the increase in childhood leukaemia up to 600 metres from powerlines, well beyond the range of powerline magnetic fields. In order to understand this finding we need to consider the separate effects of the magnetic fields and electric fields associated with powerlines.

The intense electric field on the surface of powerline cables is sufficient to ionise the air, producing so-called corona ions. This process is the cause of the characteristic buzzing or crackling of powerlines. Corona ions are small electrically-charged particles which, when emitted from powerlines attach themselves to particles of air pollution, making these particles more likely to be trapped in the lung when inhaled. In this way people living near powerlines may be exposed to increased levels of air pollution. Crucially, corona ions can be carried several hundred metres from powerlines by the wind, so effects may be felt much further away than for magnetic fields.

Corona ions are routinely emitted from high voltage powerlines, especially in wet conditions outdoors. In the 1950s, corona ions effects were measured up to 7 kilometres from powerlines both in the UK and in Germany. In today’s conditions, we have measured corona ions up to 7 kilometres from a high voltage powerline near Glastonbury, Somerset. We have previously estimated that on average corona ion effects, significant to adversely affect human health, extend to 400 metres from powerlines. In this regard, the findings by Dr. Draper of increased childhood leukaemia up to 600 m from powerlines is clearly significant.”

A 1992 Danish study conducted by Dr. Jorgen H. Olsen found a five-fold increase in the risk of childhood leukemia, lymphomas and brain tumours where children living near power lines were exposed to 4 mG.

A New Zealand study, presented at the Second World Conference on Electricity and Magnetism in Biology and Medicine, Bologna , Italy , in June 1997, found significantly increased risks for asthma, arthritis, Type II Diabetes and combined chronic health problems in adults living near transmission lines.

CELLPHONE/WIRELESS STUDIES

on the health effects of manmade electromagnetic frequencies

Cell Phone/Microwave

studies, information (includes cordless phones, all wireless)

“Exposure to electromagnetic radiation from wireless technology is causing human health problems all over the world.”

“One quarter of the people in the world are now exposing themselves to microwaves from hand-held mobile phones.” The research team in Lund University, Sweden, led by Leif Salford, referred to this as “the largest human biologic experiment ever”. They point out that soon, microwaves will be emitted by an abundance of other appliances in the ‘cordless’ office and in the home.

As noted by Dr. Henry Lai of the University of Washington, one of the world’s leading experts on the biological effects of RFR: “In the past 30-35 years there have been somewhere between 2,000 to 3,000 scientific studies done on the biological effects of RFR. Of these studies only approximately 230 have specifically involved cellular phones and their antennae, given the relatively recent widespread adoption of this technology on a global scale. Of these in excess of 70% of the studies funded independently of the cellular phone industry identify biological effects of RFR at the low power levels typical of cell phones and cellular base station antennae.”

Dr. Lai’s research, confirmed by other researchers, has shown that ELF as well as RF/MW exposures cause a significant increase in the amount of DNA breakage in rat brain cells. (Lai H and Singh NP 1995. Acute low intensity microwave exposure increases DNA single-strand breaks in rat brain cells. *Bioelectromagnetics* 16. Lai H and Singh NP 1996. Single- and double-strand DNA breaks in rat brain cells after acute exposure to radiofrequency electromagnetic radiation. *International Journal of Radiation Biology* 69.] Lai H and Singh NP 1997. Acute exposure to a 60 Hz magnetic field increases DNA strand breaks in rat brain cells. *Bioelectromagnetics* 18.)

” Most cells have a considerable ability to repair DNA strand breaks; however, some cells only have a limited ability to handle this, such as brain and nerve cells which therefore could accumulate DNA breaks. Cumulative DNA breaks may affect cell function and may be the cause of slow onset diseases such as cancer. One of the popular hypothesis for cancer development is that DNA damaging agents induce mutations in DNA leading to expression of certain genes and suppression of other genes resulting in uncontrolled cell growth. Thus, damage to cellular DNA or lack of its repair could be an initial event in developing a tumor. However, when too much DNA damage is accumulated over time, the cell will die. Cumulative damage in DNA in cells also has been shown during aging. Particularly, cumulative DNA damage in nerve cells of the brain has been associated with neurodegenerative diseases, such as Alzheimer’s, Huntington’s and Parkinson’s diseases.” (“NEUROLOGICAL EFFECTS OF RADIOFREQUENCY ELECTROMAGNETIC RADIATION”, presented at the Mobile Phones and Health Symposium, October 25-28, 1998, University of Vienna, Austria)

The National Cancer Institute in the U.S. did a study of people in industries that exposed their workers to microwaves. They found that in seven industries in the Eastern U.S. there has been a tenfold increase in brain tumors among employees who have worked there for twenty years.

Alasdair Phillips of PowerWatch:

“We now receive frequent calls from regular mobile-phone users reporting headaches, loss of concentration, skin tingling or burning or twitching, eye “tics”, very poor short-term memory, buzzing in their head at night, and other less common effects. Headaches often come first and/or skin effects. Then concentration and short-term memory tends to deteriorate. At first it can be missing the turning off a motorway that you intended to take. Then it is forgetting appointments. It usually firstly affects learning or remembering NEW facts, similar to early signs of dementia. Things you learnt long ago are still usually there, but new things just don’t seem to go in to your memory any more. Users also report excessive tiredness. Many reports are from engineers who used their phone extensively and were very skeptical of EMF adverse health effects until they started to experience them.

... Unlike the earlier analogue phones, the digital—ones emit a series of short pulses at a basic repetition rate of

217Hz. Pulsed microwaves have been shown to be more biologically active than continuous radiation of the same frequency and power level.

... up to 80% of the transmitted power can be absorbed by the user's head, which means that their brain cells are being "hit" by these radiation pulses two hundred and seventeen times every second. In addition, GSM digital phones and the new DECT cordless phones also both put high levels (several microTesla) of low frequency magnetic fields into the user's head. These may be more responsible for the dementia (memory) effects than the pulsed microwaves.

... Low frequencies (generated by the pulsed nature of GSM cell-phone signals – 217, 32 & 2 Hz) have been previously shown to lower lymphocytes ability to "mark" cancer cells and to depress the ability of other lymphocytes to destroy the 'marked' aberrant cells. Low level microwaves have also been shown to alter both the immune response and EEG activity in rabbits.

... Microwaves at only 1 mW/cm² (one-tenth of the NRPB Guidance level) have been shown to affect cAMP-independent kinase activity, and calcium ion (Ca²⁺) efflux from chick cerebral hemispheres. Continuous digital GSM phone operation near fertilised chicken eggs kill most of the embryos.

Most environmental cancers in adults take longer than ten years from initiation to detection. Asbestos has been strictly controlled since 1970, and the use of most dangerous types banned. Despite this, deaths from mesothelioma (an asbestos induced cancer of the pleura/lungs) are rising consistently and the U.K. death rate is not expected to peak until about 2020. The time between the first exposure and death is now accepted as often being between 20 and 50 years".

[end Phillips' quote]

"If there are cancer connections with the use of mobile phones, they are most likely to be expressed in adult leukaemias which typically take between 10 and 30 years to appear and be diagnosed." Alasdair Phillips, Director, UK Powerwatch EMC Engineer and EMF-bioeffects researcher.

" The hypersensitivity of the alive human organism to ultraweak microwave radiation is amply borne out by the ways in which this kind of radiation has been found to affect a wide variety of brain functions – such as electrical activity (EEG), electrochemistry and the permeability of the blood/brain barrier – and to degrade the immune system. Although the precise way in which these influences actually provoke adverse health reactions is at present unclear, there is, as already noted, an undeniable consistency between some of these non-thermal influences and the nature of many of the health problems reported, such as headache, sleep disruption, impairment of short term memory, and, more seriously, significant increases in the frequency of seizures in some epileptic children when exposed to Base-station radiation, and of brain tumours amongst users of mobile phones.

Thus, for example, the reports of headache are consistent with the fact that microwaves are known to non-thermally affect the dopamine-opiate system of the brain and to increase the permeability of the blood-brain barrier, since both of these have been medically connected with headache. The reports of sleep disruption, on the other hand, are consistent with the effect of GSM radiation on rapid eye movement (REM) sleep (see fourth reference of) and on melatonin levels – the latter being found also epidemiologically, in the case of RF exposure – whilst memory impairment is consistent with the finding that microwave radiation targets the hippocampus. Furthermore, since there is no reason to suppose that the seizure inducing ability of a flashing visible light does not extend to (invisible) microwave radiation (which can access the brain directly through the skull) flashing at a similarly low frequency, together with the fact that exposure to this kind of radiation is known to induce epileptic activity in certain animals, reports of increased seizure activity in some children that already suffer from epilepsy are perhaps not surprising. Finally, the statistically significant increase (by a factor of between 2 and 3) amongst users of mobile phones in the incidence of a rather rare kind of tumour (epithelial neuroma) in the periphery of the brain (where the radiation has the greatest access), the laterality of which correlates with cellphone use, which has been found in a nationwide

epidemiological study in the USA as part of the WTR Programme, is consistent both with the genotoxicity of low intensity microwave radiation, as indicated by the increased number of DNA strand breaks and the formation of chromosome aberrations and micronuclei in human blood (the latter being corroborated in the case of GSM radiation by the WTR Programme), and with the promotional effect of GSM radiation in the case of transgenic mice that had been genetically engineered to have a predisposition to develop cancer.” (“The Existing Microwave Safety Guidelines are Inadequate” by Dr Gerard Hyland, University of Warwick , International Institute of Biophysics, Coventry , UK)

” When the cell phone signal is held next to the brain there are changes in the brainwaves in 70% of people. This test was done at a level of about 2 microwatts per sq. cm., which is only a fraction of the actual exposure experienced from the cell phone. It is the level which is experienced at a cell phone site. In this, as in most aspects, people are not all the same. Some are more electro-sensitive. People who sleep with a cell phone by the bed have poor REM sleep, leading to impaired learning and memory. This is related to melatonin reduction.” (“The Electromagnetic Radiation Health Threat – Part I”, Interview with Dr. Neil Cherry, 8/5/97)

“Startled by billion a year in extra claims among cellphone-wielding drivers, North American insurers...found simply juggling ‘cell phones is not causing a 600% increase in accidents over other drivers busy shaving, applying makeup, tuning radios— pouring coffee, retrieving dropped cigarettes, talking and gesturing to passengers—

Instead of just another dangerous distraction, tests conducted by the U.S. Department of Energy found that using a cell phone severely impairs memory and reaction times. “Hands-free” mobile-speaker phones cause even more crashes because they typically emit 10-times more brainwave interference than handheld units.

... University of Toronto investigators report that the heightened probability of cracking up your car persists for up to 15-minutes after completing a call. That’s comparable to the risk of crashing while driving dead drunk exclaims Dr. Chris Runball, chairman of the B.C. Medical Association’s emergency medical services committee.

... A study by Dr. Peter Franch found unequivocally that “cells are permanently damaged by cellular phone frequencies.” This cellular damage, Franch [sic] noted, is maximized at low dosage – and “inherited unchanged, from generation to generation.”

Attempting to explain a 25% increase in asthma and a 5% increase in asthma-related death rates throughout rapidly “mobilizing” metropolitan Sydney, Franch [sic] found that the production of histamine, which triggers bronchial spasms, is nearly doubled after exposure to mobile phone transmissions. Cellphones also reduce the effectiveness of anti-asthmatic drugs, and retard recovery from illness. (“More Grave Cell Phone Dangers Revealed”, Will Thomas, 2-28-5)

The British medical journal The Lancet reported a study that radiation from cell phones causes an increase in blood pressure and directly alters cell function in the human body.

The UK’s National Radiological Protection Board confirms significant absorption of microwave energy in the eyes and their sockets, brain, nose, tongue and surrounding muscles.

Salford et al (1994) showed leakage through the blood-brain barrier. ...At least ten other scientific papers cited in his reference list also show blood-brain barrier effects of RFR.

Salford’s continuing research has now shown brain cell destruction of up to two percent. Some of the damaged rats were only exposed to 0.1 watt of microwave transmission, much less than the peak 0.6 watt microwave output of a typical cellphone.

Many animal studies have shown biological effects. For instance, observation of white stork nesting sites have shown that microwaves are interfering with their reproduction. (“The White Stork Ciconia” by Alfonso Balmori Vallodolid, Spain is published in Electromagnetic Biology and Medicine, 24: 109-119, 2005.)

Significant repeatable changes in the behavior of advanced mammals (cats and monkeys) have been demonstrated to be induced by oscillating EMFs (Adey WR, 1979. "Neurophysiologic effects of radiofrequency and microwave radiation." Bulletin New York Academy of Medicine 55

Animal studies are of great importance as biological effects cannot be put down to psychological effects.

"An invaluable indicator of the potential noxiousness of the pulsed microwave fields emitted by Base-stations is the increasing number of reports – some published, some as yet anecdotal – of adverse effects on the health and well-being of various animal species, specifically cattle, dogs, birds and bees. In the case of the affected cattle reported in one particular study, the cattle (which were found to line up, all facing away from the mast) displayed a variety of problems, including severely reduced milk yields, emaciation, spontaneous abortions, and still births. Especially relevant are the following facts: (i) the condition of the cattle was found to improve dramatically when they were removed to pastures well away from the mast, only to deteriorate again once they were brought back, (ii) the adverse effects appeared only after GSM microwave antennae had been erected on a tower that had formerly been used to transmit only (analogue) TV and radio signals, associated with which there had, in this case, been no evident health problems. It should be noted that this is not an isolated occurrence, similar problems with cattle being reported from elsewhere. In the case of domestic canine pets, there are several instances of their the immune systems being adversely affected, again in a reversible way. Finally, there are reports of declines in bird and bee populations following the commissioning of new Base-station masts.

Given that animals are often more highly electrosensitive than are humans, the serious nature of the health problems they have manifested over such a relatively short period of time could well portend a correspondingly serious noxiousness in the case of long-term exposure of humans, and constitute a valuable early-warning system, similar to the 'canary down the mine!'" ("The Existing Microwave Safety Guidelines are Inadequate", Dr Gerard Hyland, University of Warwick , International Institute of Biophysics, Coventry , England)

Earlier studies look at significantly smaller groups of cell phone users and/or users who have used their phones for significantly shorter periods of time in comparison to the Hardell study subjects. One expert witness characterized these differences by saying that the earlier studies are like looking for gray hair on a third grader. ("Mobile Phones & Brain Tumors", Ingrid Newkirk of EMR Network.)

In 1999, Swedish cancer specialist Dr. Lennart Hardell looked at brain tumor sufferers and found a connection between cell phone use and cancer. He found right-handed people had a two-and-a-half times higher risk of a brain tumor in the right-hand side of the brain, whereas left-handed people had nearly the same elevated risk of a left-hand side brain tumor. (Hardell L Nasman A Pahlson A Hallquist A and Mild KH, 1999. Use of cellular telephones and the risk for brain tumors: a case-control study. International Journal of Oncology)

" The Hardell study demonstrates that— for the overall use of analog cell phones, there was a 30% greater risk of developing a brain tumor compared to a person who did not use a cell phone. For subjects who used analog cell phones for 10 years or more, the risk increased to almost 80 per cent.

In the "Discussion" portion of the study Hardell notes: 'Furthermore, digital cellular phones have not been in use for as long as the analogue ones, which would be of importance for carcinogenesis. This was exemplified in our study with median time of use (tumor induction period) of 7 years for analogue phones, 3 years for digital phones, and 5 years for cordless phone.'" (Janet Newton, news release for EMR Network).

In analogue cellphones there is a very high frequency FM radio. (FM is used for radio and television signals.) [Digital cellphones and cordless phones are similar to radar, using pulses carried by microwaves —Shivani]

As stated by Alasdair Phillips of PowerWatch:

" Investigations of thousands of cases of brain tumours and mobile phones of all types has found up to a 50% increased risk of a brain tumour after five years, which doubles after ten years.

This new paper is an update of their previous published study and was based on the analysis of 1,600 tumour victims who had been using mobile phones for up to 10 years before being diagnosed. Prof Mild now states: 'The evidence for a connection between phone use and cancer is clear and convincing. The more you use phones and the greater the number of years you have them, the greater the risk of brain tumours.'

An earlier study by Mild, a cancer specialist, linked brain tumours to the use of analogue mobile phones. The new research repeated this and included digital (GSM) mobiles and DECT cordless phones. It showed that all three types were linked with increased tumour rates. The extra tumours only start to really show up after about 5 years use, but there is increasing dose-related-response with minutes of use per month and number of years of use.

The increase in tumours for cordless phone use only become significant after about 10 years, but all the evidence is mounting up to show that people should only use wireless phones of any sort when there is no alternative."

Tumours, dementia and chronic fatigue syndrome are three of the devastating outcomes for which increases in risk have now been indicated. ("Further aspects on cellular and cordless phones and brain tumours". Lennart Hardell, Kjell Hansson Mild and M Carlberg International Journal of Oncology, 22:399-407, 2003.)

The Wireless Technology Research (WTR), a research body sponsored by the cell phone industry, announced in May, 1999 that a study performed at Integrated Laboratory Systems in Triangle Park, North Carolina, on human blood cells showed a tripling in chromosome damage caused by cell phone radiation. According to Dr. Carlo, the chairman of WTR, this is a strong link to cancer.

In 1997, Dr. Miguel Penafiel and his team of the Catholic University of America in Washington, DC, found that cell phone radiation increased the activity of a cancer-related enzyme called ornithine decarboxylase (ODC).

Scientists at Aarhus University in Denmark have in 1997 shown that cell phone radiation accelerates the proliferation rate of human cells.

Scientists at the Department of Life Sciences, University of Nottingham, UK, have shown that transgenic nematodes, used to monitor toxic pollutants, become stressed by cell phone EMFs in the same way as they do by toxic chemicals.

DePomerai et al (2000) reported an increase in hsp or heatshock protein equivalent to that produced with a 3 degree Centigrade rise in temperature with low-level microwave irradiation at a SAR of only 0.001 W/Kg. Non-thermal microwave radiation disruption of weak bonds that maintain the active form of protein folding at 750 MHz continuous wave may increase free radicals causing DNA damage and interfere with cell signaling that controls cell growth.

"A study carried out by Professor Om Ghandi, head of electrical engineering at the University of Utah in Salt Lake City, found that 10 year-olds absorbed 10 per cent more radiation than adults when making a call, and five-year-olds 50 per cent more. "The handsets are logically closer to the brain and the brain cells than with adults," he said.

" Absorption of microwaves of the frequency used in mobile telephony is greatest in an object about the size of a child's head – the so-called 'head resonance' – whilst, in consequence of the thinner skull of a child, the penetration of the radiation into the brain is greater than in an adult.

....The still developing nervous system and associated brain-wave activity in a child (and particularly one that is epileptic) are more vulnerable to aggression by the pulses of microwaves used in GSM than is the case with a mature adult.

....The increased mitotic activity in the cells of developing children makes them more susceptible to genetic damage.

A child's immune system, whose efficiency is, in any case, degraded by radiation of the kind used in mobile telephony, is generally less robust than is that of an adult, so that the child is less able to 'cope' with any adverse health effect provoked by (chronic) exposure to such radiation." ("The Existing Microwave Safety Guidelines are Inadequate", Dr. Gerard Hyland, University of Warwick, International Institute of Biophysics)

Dr Kjell Hansson Mild reported on an extensive survey of ten thousand cell phone users in Norway and Sweden conducted because of the concern about symptoms such as dizziness, discomfort, concentration problems and memory loss experienced by people using cellphones. Even larger responses included fatigue and headache and a sense of warmth on and behind the ear along with a tingling sensation and burning of the skin. These symptoms were of particular significance because the ordinary use of the telephone does not produce the sense of warmth. It is the microwave radiation from cellphones, at sufficient intensity to produce warming, which, in this research, is associated with neurological symptoms.

In the extremely large sample in the report, when the data was ordered by the number of calls per day and by the number of minutes per day on average spent on the cellphone every symptom showed an increase with usage.

"...Reiser et. al., demonstrated that the extensive exposure to microwave radiation has been found to affect a wide variety of brain functions such as electrical activity (EEG), electrochemistry, 7-8 permeability of the blood/brain barrier and to degrade the immune system. 10Becker and Marini, and Frhlich et al reported that headache is consistent with the fact that microwaves are known to non-thermally affect the dopamine-opiate system of the brain and to increase the permeability of the blood-brain barrier since both of these have been medically connected with headache. On the other hand, the reports of sleep disruption are consistent with the effect of GSM radiation on rapid eye movement (REM) sleep and on melatonin levels whereas, memory impairment is consistent with the finding that microwave radiation targets the hippocampus. Hermann and Hossmann, reported the adverse health effects of mobile phones and found that the use of mobile can cause sleep disturbance, memory problems, headaches, nausea, dizziness, promote cancer and high blood pressure.

...Nakamura, et. al., demonstrated that exposure to high-density microwaves can cause detrimental effects on the eyes, testis and other tissues and induce significant biologic changes through thermal actions.

...Khudnitskii et al, studied the influence of ultrahigh frequency radiation caused by cellular phones on functional state of central nervous system, cardiovascular systems and local temperature changes in cellular phones users. The head area near the phone antenna appeared to be under the most intensive heating. Ultrahigh frequency radiation induces significant changes in local temperature and in physiologic parameters of central nervous and cardiovascular systems." ("Association of mobile phone radiation with fatigue, headache, dizziness, tension and sleep disturbance in Saudi population", Thamir Al-Khlaiwi, Sultan A. Meo)

As recognised in the recently published Report of the UK Independent Expert Group on Mobile Phones:

"...The multi-frame repetition frequency of 8.34Hz and the 2Hz pulsing that characterises the signal from a phone equipped with discontinuous transmission (DTX), lie in the range of the alpha and delta brain wave activities, respectively. The fact that these two particular electrical activities are constantly changing in a child until the age of about 12 years when the delta-waves disappear and the alpha rhythm is finally stabilised means that they must both be anticipated to be particularly vulnerable to interference from the GSM pulsing."

The results of a the study by the Spanish Neuro Diagnostic Research Institute in Marbella have demonstrated that a call lasting just two minutes can alter the natural electrical activity of a child's brain for up to an hour afterwards. And they also found for the first time how radio waves from mobile phones penetrate deep into the brain and not just around the ear.

Dr Michael Klieseisen, who conducted the study, said: "We were able to see in minute detail what was going on in the brain. "We never expected to see this continuing activity in the brain. "We are worried that delicate balances that

exist – such as the immunity to infection and disease – could be altered by interference with chemical balances in the brain.”

Doctors fear that disturbed brain activity in children could lead to psychiatric and behavioural problems or impair learning ability.

The ELF output from the body of digital phones usually is around 10-20 mG with peak values up to around 50 mG, well above the 2 mG level believed by many scientists, and the Swedish authorities as well, to be the limit above which the health risks compared to non-exposed conditions become significantly increased.

“...The MW output from the antenna of the phones vary somewhat, usually it is within the region of 0.5-1.0 W, giving specific absorption rates (SAR) of up to 0.5 W/Kg. This is well below the official “safety” standards which vary somewhat from one country to another

...the US ANSI/IEEE applicable standard is 1.6 W/Kg. However, the problem is that these safety standards are meaningless according to the latest research, showing that the induction of biological effects from EMFs have little to do with energy absorption. Research has shown significant induced effects at energy absorption rates tens of thousands of times below the ‘safety’ limits.”

“...Changes induced by EMFs are able to trigger a cascade of different effects ranging from gene translation/transcription, enzyme activities, hormonal secretions, neurotransmitter secretions, repair mechanisms, immune system responses, heart functioning, brain functioning, cell proliferation, cell apoptosis (programmed death), cell transformation, tumor suppression, tumor induction, and tumor promotion, among others. Which response particular cells or bodies show will depend on the actual situation in the system: genes, strength of homeostatic balance (health), situation, other stressors, etc. No one knows the exact long term effect in a certain organism until it is too late.” (text found at ICS/EMF Issues)

WASHINGTON, Feb. 20, 2002 (AP)

“(CBS) Some shields touted as protecting cell phone users from radiation don’t work as advertised and may cause the wireless devices to emit even more energy, the Federal Trade Commission said Wednesday.

The agency announced it had filed charges against two companies for promoting the shields with unsupported claims such as “prevents electromagnetic waves from penetrating the brain” and “blocks up to 99 percent of the radiation” emitted from cell phones that some fear could cause brain cancer.”

Independent testing of several products supposed to protect cell phone users from radiation yielded discouraging results. Some did nothing whatsoever, some yielded less protection than claimed and only in certain phone positions, and some actually increased the amount of radiation absorbed. They found that the “earpiece wire on the hands-free kits we tested acts as an aerial – and channels three times as much radiation to your head.” (“The Ring of Truth,” Which magazine, April 2000)

“Consumers are advised to shop wisely and to purchase only what they understand. Fake technology claiming protection that is hidden in mysterious disks and crystals have been marketed as “radiation shields” by their peddlers but more accurately called “superstitious pacifiers” by objective analysts. Worse, it has been shown that “radiation shields” may in fact increase danger! In early 2002, The Federal Trade Commission (FTC) filed a lawsuit against two “cellphone shield” makers. The FTC claims that the targeted shields don’t work as advertised and may actually increase unwanted exposure to microwave transmission .

Further many people mistakenly think that they avoid microwave exposure from their cellphones by using the standard electric earphone. Little do they realize that by using an electric earphone they have actually increased the electric circuitry that can bring the unwanted microwaves directly into their ear and head and around their body. Multiple independent tests have measured up to four times the radiation coming out of the earpiece of a cellular

phone, than out of the antenna.

....In a test performed by IMST in Germany, for the October 20, 1999 ABC News 20/20 segment on Cellphone Safety, they found that four out of five of the phones they tested exceeded the standard in at least one testing position. They determined that a phone would pass or fail the safety standard based upon what angle the phone was held at during the test. The standard was reportedly entirely ambiguous in this respect, allowing phone manufacturers to simply re-orient their phone until it passes the test. One popular model exceeded the standard in both positions tested, and would only pass when a remote earpiece was used. (<http://www.wave-guide.org/library/cellphones.html>) [Remember that the "safety standard" was only designed to prevent physical heating of your head, and does not protect you at all from frequency-related effects. However, you are apparently not being protected from heating, either. Others have found similar discrepancies between listed SAR and actual phone SAR. —Shivani]

Insurers Balk at Risks of Phones

By Sarah Ryle, Consumer Affairs Correspondent Sunday April 11, 1999, The Observer, London

"Concern about the safety of mobile phones has prompted a leading Lloyd's underwriter to refuse to insure phone manufacturers against the risk of damage to users' health. The move comes amid mounting concern about the industry's influence on research into the long-term effects of using a mobile. The London market provides insurance for everything from aircraft to footballers' legs. But fears that mobile phones will be linked to illnesses such as cancer and Alzheimer's disease have prompted John Fenn, of underwriting group Stirling, to refuse to cover manufacturers against the risk of being sued if mobiles turn out to cause long-term damage.

....Fenn said: 'there are people in the insurance market who close their eyes to the issue because they say there is no scientific proof of a problem. If you go back to asbestos, it "wasn't a problem" at one time either.'

Last Updated (Tuesday, 28 November 2006)

CORDLESS PHONES / PROXIMITY TO COMMUNICATIONS TOWERS / POLITICS IN RESEARCH

On the health effects of manmade electromagnetic frequencies

Cordless Phones

A significant danger to health due to pulsed electromagnetic radiation

Cordless phones have for some reason been misperceived by the public as safer than cell phones, though in fact the frequencies used by new cordless phones are in the same microwave range used by cell phones. They have a number of features that makes them particularly dangerous, as explained in an article by Alasdair Phillips.

" Unlike the 'intelligent' mobile phone system in which the base station directs the handset to turn down its output to the lowest adequate level once the link is established the DECT phone does NOT . [In England, cordless phones are called DECT phones. DECT stands for Digital Enhanced Cordless Technologies -Shivani]

The cordless phone and additional handsets will dominate the microwave field levels inside a house, probably the entire house, and through walls to and from the neighbors. [Recently a woman told me that her family's cordless phone worked several miles from the base left at home. —Shivani]

The base-unit of a DECT phone emits pulses of microwaves 24 hours a day as long as it is plugged in. In use or not emissions within a metre from a base unit can be as high as 6 volts per metre. In a survey 'Powerwatch' have recorded levels as high as 3 volts per metre in a BEDROOM immediately above a sitting room with a DECT phone unit on a desk . [U.S. cordless phones do not share all the characteristics of UK phones. For instance, some broadcast continually while others only broadcast when being used. – Shivani]

During use DECT phones emit low frequency magnetic field pulses into the side of the user's head. These are typically up to 0.5 microtesla in strength, childhood leukaemia has repeatedly been associated with low frequency

magnetic field levels over 0.2 microtesla.

Investigations (by Dr. Hardell & Professor Mild 2003) of thousands of cases of brain tumours and mobile phones of all types has found up to a 50% increased risk of a brain tumour after five years which doubles after ten years.

....Base units and handsets should certainly be kept away from where you sleep and where you may spend hours relaxing in a favourite seat. This includes base units on the other side of a wall....

....There are a hundred bursts of 250 milliwatts of microwave radiation next to the users head every second.

....The regular pulsing disrupts our brain's intercellular signaling. In rats it is known the frequencies of these phones can interfere with the workings of the blood/brain barrier allowing toxins into the brain itself forming tumours."

Research sponsored by the Department of Health at Bristol Royal Infirmary in western England showed portable telephones may alter memory and interfere with concentration and spatial awareness.

Is the convenience of a cordless phone or wireless baby monitor that broadcasts microwaves through your home 24/7 "to die for?"

Proximity to communications towers

The health effects of living near wireless communications towers.

"A study done in France by Santini showed significant associations between symptoms fitting to the microwave sickness and the distance to mobile phone base stations [11]. It should be noted that the health related symptoms were most frequently reported at a distance of 50 – 100 m, which fits perfectly to the area with the highest microwave exposure in urban areas, where the main beam of the antennas usually hits the first houses. The second study done in Austria showed significant positive associations between the frequency selective measured electric field (GSM 900/1800) in the bedroom and cardiovascular symptoms.... In 1987.... in Hawaii.... Drs. Anderson and Henderson of the Hawaii Department of Health found in residential areas with 12 communication towers, a relative risk for cancer, including leukaemia, of 1.375 (37.5% increase." ("The Microwave Syndrome: Further Aspects of a Spanish Study", by Gerd OBERFELD et al. 1 May 2004.)

[Milwaukee, Wisconsin, USA, has a similar "antenna farm." Also a "mysteriously high" breast cancer rate. —Shivani]

A study of cancers around the BBC Sutton Coldfield transmitter mast (Dolk, et al, 1997) found a statistically significant doubling of adult leukaemia within 2 km radius.

The Naila Study, Germany (November 2004) – This study, conducted over 10 years was released by The Federal Agency for Radiation Protection, Germany. Medical doctors compiled case histories since 1994 – 2004, looking at heightened risk of taking ill with malignant tumours. They discovered a threefold increase after five years exposure to microwave radiation from a mobile phone mast transmitter for up to 400 metres distance, compared to those patients living further away. ["If the city-wide WiFi system being planned for Milwaukee, Wisconsin, USA, is erected, aWiFi broadcaster 20 feet from a Milwaukee home will be the equivalent of a microwave tower 600 feet away, roughly 200 meters." — Arthur Firstenberg]

A study carried out by Ronni Wolf MD and Danny Wolf MD, Kaplan Medical Centre, Israel (April 2004) discovered a fourfold increase in cancer within 350 metres after long-term exposure to microwave radiation from a mobile phone mast and a tenfold increase specifically among women, compared to patients living away from the mast.

In 1980, Dr. John Holt had a letter published. This showed that between 1951-59, 50% of patients with CML in Queensland survived for 55 months following diagnosis. In 1960 and 1961 three large TV broadcast stations were commissioned in the area. In the period 1963-67, 50% of patients with CML only survived for 21 months. This dramatic change could not be explained by any medical personnel, protocol or therapy changes.

“Bamberg, Germany 26-April, 2005

Dr. C Waldmann-Selsam, Dr. U. Säeger, Bamberg , Oberfranken evaluated the medical complaints of 356 people who have had long-term [radiation] exposure in their homes from pulsed high frequency magnetic fields (from mobile phone base stations, from cordless telephones, amongst others).

People suffer from one, several or many of the following symptoms: Sleep disturbances, tiredness, disturbance in concentration, forgetfulness, problem with finding words, depressive mood, ear noises, sudden loss of hearing, hearing loss, giddiness, nose bleeds, visual disturbances, frequent infections, sinusitis, joint and limb pains, nerve and soft tissue pains, feeling of numbness, heart rhythm disturbances, increased blood pressure episodes, hormonal disturbances, night-time sweats, nausea. Dr. John Walker’s research clearly shows the clusters of illness appear in radiation at exposures of around 1.5v/m, which is below the guidelines significantly permitting around 40 to 50 v/m (varying according to microwave frequency).” (“Mobile Phone And Mast Radiation – How Dangerous Are These,” Eileen O’Connor for EM Radiation Trust, Oct. 1, 2005)

Politics in Research

How industry influences the research/researchers of electromagnetic radiation

The following are examples

Express Newspapers 24 May, 1999

“Two of the world’s leading radiation experts told The Express that multinational companies tried to influence the results of their research. Professor Ross Adey, a biologist, had his funding withdrawn by Motorola before completing research which showed that mobiles affected the number of brain tumours in animals. Dr. Henry Lai, who has been studying the biological effects of electromagnetic fields for 20 years, was asked three times to change findings on how they caused DNA breaks in rats.

....Prof Adey, of the University of California, a former senior NASA adviser, was paid by Motorola to carry out a series of animal experiments between 1993 and 1996. “The animal experiments were conducted very strictly and in the case of digital phones we found an effect on the number of brain tumours in rats,” he said. “It became clear that Motorola preferred we found nothing.

During our funding there was constant discussion about the wording of abstracts and papers. Funding was suddenly withdrawn in November last year. In recent months, while we were trying to finish writing up the experiments, we have not been paid.

Basically the industry is not really interested in diligent pursuit of scientific evidence which should be available to the public. All they want is research that supports their claims.”

“Control of the research programmes has passed to managers and lawyers. This is exactly what happened in the tobacco industry.” Dr. Lai, of the University of Washington, Seattle, described the industry’s interference as “unpleasant and intolerable”.

The Express also reported on October 16, 1999 that a scientist who was paid millions by mobile phone companies to investigate health risks has bitterly criticized them for failing to act on his findings.

Dr. George Carlo found that the rate of death from brain cancer is higher among mobile phone users and the risk of contracting a rare tumour on the outside of the brain is more than double.His research body was handpicked by the industry was given £15 million to carry out a six-year study into the health effects of mobile phones.

In an astonishing attack on the industry for which he once acted as a spokesman, he accused firms of not taking safety seriously. “The companies are now spending millions trying to discredit me because, basically, they didn’t like

what I told them”, he revealed to The Express.

Dr. Carlo said: “Following my presentation I heard by voice vote of those present, a pledge to do the right thing in following up these findings. But since I presented my findings, which they found surprising, they have failed to do anything. In that time there have been another 15 million users in the States and thousands more in Britain. From a consumer point of view the delaying tactic is not good but from a business point of view its great”. Alasdair Phillips, of the consumer group Powerwatch, said: “To have someone like him, who has even acted as a spokesman for the industry, come out and say this is quite amazing. There is a definite link between mobiles and brain cancer which the companies can’t continue to ignore”.

Re. Workshop Consensus Statement HSP-Helsinki 2004

Dear Dr. Haberland,

I have read the so-called revised version of the Helsinki meeting on hsp70 on the COST website (a highly inappropriate site for this report, by the way). Before this meeting I knew that any research that indicated that hsp70 was NOT only induced by heat, would be an exercise in futility. The safety standards for cell phone use are firmly in the hands of the cell phone industry. And, apparently, that is where they will stay at least until there is a cancer epidemic in a country like Israel where everyone, including small children, are connected to each other by cell phones because of the volatile and dangerous environment there daily.

We have measurements on SAR at the Drosophila level. We have detailed engineering measurements made while phone was on and off. We have controls and resent the statement in the summary report that we do not. These and other relevant details are contained in our paper (Weisbrot et al, 2003 J Cellular Biochem*) and should be read by any honest scientist. Furthermore, the reported measurements were peer reviewed. The reporter for BEMS Newsletter distorted the reports given at this Helsinki meeting and I have so informed them. It contradicts the Mays Swicord and BEMS reporter version (the latter, incidentally, was the only reporter allowed into the meetings).

As in so many instances in the past, the cell phone industry goes out of its way to discredit any scientific data that is contrary to their agenda.

Sincerely yours,

Reba Goodman
Professor
Department of Pathology
Columbia University
New York, NY

*Effects of mobile phone radiation on reproduction and development in drosophila melanogaster

[Similar incidents continue to occur. Honest research and researchers have suffered suppression, and worse, from the get go. For historic perspective: Paul Brodeur’s The Zapping of America: Microwaves, Their Deadly Risk and the Coverup (1977) is a classic. Newer (1989) his Currents of Death: Power Lines, Computer Terminals, and the Attempt to Cover Up Their Threat to Your Health and The Great Powerline Coverup. Also, The Electric Wilderness by Andrew Marino and Joel Ray. Health dangers, tactics used by utilities.

To read about what happened when seven different researchers each demonstrated that low-level magnetic fields neutralize the ability of tamoxifen to inhibit the proliferation of breast cancer cells, see “When Enough Is Never Enough”. — Shivani]

CORRUPTION AT THE WORLD HEALTH ORGANIZATION

“Precautionary policies should not be applied to EMFs,” states Dr. Michael Repacholi. (MWN, S/O 01).

As reported in Microwave News, Mike Repacholi, the head of the WHO EMF project, “recruited utility representatives to help write the original draft of the WHO document recommending exposure levels, and later asked them to review the completed draft. Repacholi invited eight utility representatives to attend task group meeting -the only observers who were invited.

Dr. Repacholi also denied Prof. Johansson participation in the WHO workshop summary, although he participated in this workshop. It is not a coincidence that the recommendation to governments to discourage the public from measuring radiation in their homes emerged from this workshop group. This is an active harm to the public.”

” On the 5th of July 2005, it was publically [sic] published that Dr. Michael Repacholi – Coordinator of the WHO’s Radiation and Environmental Health Unit- receives \$150,000 a year directly from the cellular phone industry with additional money for meetings and travels, meaning he broke the rules of the WHO which bar to receive money directly from the industry.” (microwavenews.com 5.7.05).

In addition, Dr. Repacholi is documented as having invited power industry representatives to participate actively in setting public health standards for electromagnetic fields emitted by powerlines and transformers. (Microwavenews.com 1.10.05, 22.9.05) It is important to note that this happens despite the fact that Dr. Repacholi said himself to a Senate Committee Inquiry that: “[T]he world health Organization does not allow industry to participate in either standard setting or in health risk assessment. The WHO takes the view that there cannot be industry representation on standard setting working groups. There cannot be someone on the working group who is having an influence on health effects for an industry when they derive benefit from that industry.” Reference: “Inquiry into Electromagnetic Radiation”, Report of the Senate Environment, Communications, Information Technology and the Arts References Committee, Section 4.115, page 151, May 2001

Professor Olle Johansson of the Karolinska Institute, one of the key referral institutions for the WHO reported that at the Prague conference on electromagnetic sensitivity, Dr. Repacholi distributed disinformation about the acknowledgement of electrosensitivity by the Swedish government.

Mike Repacholi (of WHO’s EMF project) was recently reported in New Scientist (10th September 2005, page 14) as saying that “the worst effects of the Chernobyl nuclear accident are mental health problems brought on by too much worry.”

[Repacholi was also involved in a follow up report on Chernobyl that apparently falsified death/disease statistics at the behest of the nuclear energy industry, which was set back by public concern due to the Chernobyl disaster. “The joint press release from the International Atomic Energy Agency, World Health Organization and United Nations Development Program has sent shockwaves throughout the world and brought strong condemnation from physicians, environmental organizations, religious groups and even some political parties.” (The Nuclear Reporter #634 9/16/05) — Shivani]

Documents published lately indicate that tobacco industry and asbestos industry both were very much involved with WHO and managed to prevent stricter actions to protect the public. (with regard to tobacco- www.microwavenews.com 22.9.05, with regard to asbestos- Ladou Joseph, Environmental Health Perspectives Volume 112 no. 3 March 2004)

November 2, 2004 – The World Health Organization’s EMF Project is advising national governments against setting stricter exposure limits for exposures to electromagnetic fields (EMFs) to protect children from leukemia.

The W.H.O. EMF project states that “WHO believes exposure limits should be based on effects conventionally regarded as established and are not an appropriate mechanism for implementing precautionary approaches. Therefore WHO does not recommend including exposure limits based on the childhood leukemia data as an option.”

As pointed out by Lewis Slesin in MWN, 11/2/04, “The current ICNIRP exposure limit is 1,000 mG (100 µT) for the general population. Epidemiological studies have consistently shown a leukemia risk to children exposed, on average, above 3-4 mG (0.3-0.4 µT).”

[The effect “conventionally regarded as established” is simple tissue heating. As long as this, the absurdity of which has been proven over and over, remains the basis of “safety” standards, industry can continue to recklessly irradiate all living beings, and the health damage caused will continue and increase. The effects most important to industries and their political friends are money and power, not the suffering occurring due to present standards. Common sense, evidence, logic and compassion are not part of the decision making process here.

The WHO has also denied that there is any indication that lowering internationally accepted limits would reduce the prevalence of symptoms attributed to EMF, advised that persons complaining that electromagnetic radiation is affecting their health be given psychological evaluations, and advised governments to discourage people from taking measurements of radiation levels in their homes. The World Health Organization may be criminally liable for offences in the countries that follow these guidelines. Outraged international experts may take legal action. Stay tuned. —Shivani]

SAFETY STANDARDS

How the non-ionizing electromagnetic radiation “safety” standards were set and why they are not relevant

The Precautionary Principle indicates that, when there is plausible scientific evidence of significant harm from a proposed or ongoing activity, preventive or corrective action should be taken to reduce or eliminate that risk of harm, despite residual scientific uncertainty about cause and effect relationships. Although there is general agreement on the principle, humans to date have often failed dramatically in the practical application of it. As noted by Alasdair Phillips of Powerwatch, “History is filled with examples of “perfectly safe” environmental factors that later turned out to be harmful, if not disastrous....Even the American Medical Association (AMA) accepted tobacco advertising in its journals, with such statements as, “They won’t harm anybody. They will prove enjoyable.”

“There is almost always a delay between the occurrence of public health effects and avoidance or minimization measures. A new substance or technology is introduced. It is found to be useful and becomes widely used.

“People start noticing an increase in a symptom, which they suspect might be due to the chemical or device being used. Safety assurances are given by manufacturers and government agencies. A search of the diverse sources of scientific studies reveals evidence of associations, cellular changes or animal effects, but there is no direct human evidence of effects. Early human studies often don’t find evidence of effects, or some find a small but statistically insignificant rise in symptoms. Cancers have latencies of decades for many adult cancers. That is, it takes typically eight to thirty years for damaged cells to develop into full-blown cancers.

“Subsequently, occupational groups who have a distinctly higher chance of exposure are studied and found to have a higher incidence of the disease symptoms. The study is repeated and confirmed. We then have evidence of a human health effect, and exposure standards are set below the level at which effects have been found (by association), with significant safety factors to allow for the general population, which includes a proportion of very vulnerable and susceptible people.” (“Cell phones – a boon to modern society or a threat to human health?” an interview with Dr. Neil Cherry by Dorothy Hunt, M.A. F.T.C.L., 29/1/99 , <http://www.nzine.co.nz/features/cellphones.html>)

[However, the political clout of profiting industries can delay or side rail setting of safety standards. This is the stage we are now at. The results of the epidemiological studies are unequivocal, several mechanisms have also been discovered, yet standards that clearly allow injury to continue remain unchanged. Once again, the wealth of a few has been given priority over the health of many. —Shivani]

Time magazine reported, on July 30, 1990, that Louis Slesin of Microwave News, has printed what may be his

greatest scoop: the key paragraph of a two-year Environmental Protection Agency study recommending that so-called extremely low-frequency fields be classified as “probable human carcinogens” alongside such notorious chemical toxins as PCBs, formaldehyde and dioxin. The recommendation, which could have set off a costly chain of regulatory actions, was deleted from the final draft after review by the White House Office of Policy Development. “The EPA thing is a stunner,” says Paul Brodeur, a writer for the New Yorker. “It’s a clear case of suppression and politicization of a major health issue by the White House.”

An explanation said the basic interaction between EM fields and biological interactions leading to cancer are not understood. Yet, in the same report, they suggest there is a causal link between leukemia, lymphoma and cancer in children with exposure to magnetic fields from residential 60hz distribution systems! One must wonder how these two contrasting statements coexist in the same report.

Paul Brodeur wrote of the EPA report in the New Yorker: “...the summary-and-conclusions section of the draft EPA report contained a persuasive indictment of power-line magnetic fields as a cancer-producing agent. Its authors stated that five of the six case-control studies published in the peer-reviewed medical literature showed that children who lived near power lines giving off strong magnetic fields were developing cancer more readily than children who did not live near power lines.”

Martin Halper, a director of the EPA, said in a December 1990 Fortune magazine article: “In all my years of looking at chemicals, I have never seen a set of epidemiological studies that remotely approached the weight of evidence that we’re seeing with ELF electromagnetic fields. Clearly there is something here.”

In a leaked United States National Council on Radiation Protection report funded by the Environmental Protection Agency and written by eleven leading American experts in EMFs. Bob Edwards, in the October 7, 1995 issue of New Scientist, writes that the report recommends an EMF safety limit of 2 mG (0.2 microteslas). He writes: “EPA officials say the report is the most comprehensive study ever on the health effects of low-frequency EMFs. Its findings represent a fundamental challenge to the electricity industry. The authors say that their recommendations, if accepted, could force ‘complex and costly’ changes in society’s use of electricity.”

In a July 16, 2002 letter from Norbert Hankin of the EPA’s Center for Science and Risk Assessment, Radiation Protection Division to Janet Newton, President of The EMR Network, Mr. Hankin writes: “The FCC’s current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-Ionizing Radiation Protection, are thermally based, and do not apply to chronic, non-thermal exposure situations.”

“[The] FCC.... issued regulations setting public exposure limits for microwave radiation at levels at least ten thousand times higher than levels which, according to the Environmental Protection Agency, were causing reports of illness from all over the world..

Digital (pulsed) technology is more harmful at lower levels of power than analog. The FCC’s mandate to replace all analog TV, radio, and telecommunications transmissions with digital during the next few years is very dangerous.” (Arthur Firstenberg, Telecommunications vs. The Environment)

Cell phones are rated for “safety” according to SAR.

” Radio frequency (RF) and microwave (MW) field intensities are usually measured in milliwatts per square centimeter (mW/cm²). However, the intensity provides little information on the biological consequence unless the amount of energy absorbed by the irradiated object is known. This is generally given as the specific absorption rate (SAR), which is the rate of energy absorbed by a unit mass (e.g., one kg or one g of tissue) of the object. The unit of measurement for the SAR is watts per kg (W/kg).

The rate of absorption and distribution of RF/MW energies depend on many factors like type and shape of tissue, orientation relative to the radiation, type and parameters of the radiation, etc. The distribution of absorbed energy in

an irradiated organism is extremely complex and non-uniform, and may lead to the formation of so called “hot spots” of concentrated energy in the tissue. EMF Issues

[Cell phone “safety tests” are done by exposing fluid in a plastic head to a cell phone held next to the “ear” while the temperature of the fluid is monitored. The safety level” is then set at a level that did not overheat the fluid. This has nothing to do with the level of RF/MW frequency radiation that causes harm to living humans and animals in non-thermal ways. (A plastic head cannot possibly suffer from conditions such as insomnia, headaches, forgetfulness, inability to focus, Alzheimer’s or cancer.) Despite considerable evidence in published scientific literature for biological effects of electro-magnetic radiation in the RF/MW range of the spectrum at specific absorption rates (SARs) far too low to produce a heating response, the standard has not been updated to conform to reality. Your brain is not a plastic piñata. – Shivani]

” Existing Safety Guidelines, based solely on consideration of the SAR, afford no protection againstfrequency-specific effects,

....In order that the radiation can exert non-thermal influences, it is essential that the organism be alive, for only then are the various oscillatory endogenous electrical activities excited, via which the radiation can access the system..

....Clearly, non-thermal influences are connected more with the transfer of information from the irradiating field to the alive organism, through the latter’s ability to ‘recognise’ certain frequency characteristics of the radiation, than with its ability to absorb energy from the field.” (“The Existing Microwave Safety Guidelines are Inadequate”, Dr. Gerard Hyland, University of Warwick , International Institute of Biophysics)

In this same paper, Dr. Hyland suggests that at locations where there is any long-term exposure, power densities should not exceed 10 nanoW/cm².

“About 1997, ICNIRP (International Commission for Non Ionizing Radiation Protection) took a very narrow view of the reasons for susceptibility of the bodies of living beings to Non Ionizing Radiation. They merely considered the heating effect and ignored the most important effects.In Germany , Bamberger <0.06 volts/metre give 30% illness, 0.06 -0.2 volts/metre gives 60% illness. These values are relatively close compared to ICNRP 41 volts/metre!” (Dr. John Walker)

....Magras & Xenos (1997) have reported irreversible sterility in mice after 5 generations of exposure to 0.168 to 1.053 microwatts per square centimeter in an “antenna park.” Note that the current, applicable US exposure standard would be 579 microwatts per square centimeter, — 500 times higher! — and that this very low exposure level would relate more to a person living near a Cellular Tower, than a phone user. (<http://www.wave-guide.org/library/cellphones.html>)

“Table 1 shows the international standards and safety guidelines established by the International Commission on Non-Ionizing Radiation Protection.

These exposure standards were established in 1990, more or less arbitrarily. The problem with these standards is that numerous scientific studies have shown significant biological effects induced by EMF at field strengths thousands of times below these safety standards.

Table 1: ELF safety standards

Exposure	electric field	magnetic field
Occupational		
Whole Day	10 kV/m	5,000 mG
Short term	30 kV/m	50,000 mG
Limbs	—	250,000 mG
General Public		
Up to 24 hrs. a day	5 kV/m	1,000mG

Short term 10kV/M 10,000 mG

(from: <http://www.icswebsite.com/emf/emfissues/emfissues5.html>)

Stating that non-ionizing radiation can only harm you if it heats your tissues makes about as much sense as stating that cigarettes can only harm you by burning you.

The International Agency for Research on Cancer (IARC) has classified magnetic fields as a possible carcinogen.

In Russia:

” The threshold principle of injury to health is used as the basis of EMF limits .

....The bioeffects of microwaves were evaluated on the base of functions of the central nervous and neuroendocrinal systems, unspecific and specific immunity, generative function and etc.

....The results of the experimental researches have shown distinct dependence between

microwaves bioeffects and the intensity of exposure. They have confirmed the earlier available data about the expressed biological effect of microwaves exposure to the power density of 4 mW/cm² and especially 10 mW/cm² . The effects of the indicated intensity provoked distinct changes of functional condition of the central nervous and endocrinal systems, immunity and etc.

....The analysis of all data has allowed to establish that the parameters of effects characterizing the threshold of affect of the factor are 1 mW/cm² for T = 120 min (S = 120mW/cm² or 2000 μW . h/cm²) and 10 mW/cm² for 25 min > T > 6 min (4166 μW . h/cm² > S>1000 μW (h/cm²).

....It is necessary to take into account chronic long-term irradiation.” (THE RUSSIAN STANDARDS AND THE OPINION ABOUT INTERNATIONAL HARMONIZATION OF ELECTROMAGNETIC STANDARDS, Grigoriev Yu., Institute of Biophysics, Centre of Electromagnetic Safety, Russia, Moscow)

Dr. Chris König from the Public Health Department in the City of Salzburg explained that in that city they had adopted an interim public exposure standard based on a study which showed cellphone effects on sleeping subjects, and a safety factor of 500, resulting in a preliminary public exposure standard of 0.1mW/cm² .

(Safety factors used for toxic chemicals range from 1 to 10,000.)

The European standard for safety for ELF fields is “20,000 milligauss is safe”, whereas experiments show that 2 milligauss causes a significant reduction in the cleansing effect of melatonin on cancer cells.

The following countries/regions are among those that have set exposure limits are below the factor 9 -espoused by the ICNIRP Guidelines: Greece, Italy, Belgium, Luxembourg, France (Paris), Austria – Salzburg, Spain (Regional Castilla-La Mancha), Switzerland (Prolonged Exposure), Russian Federation and Australia.

Kazakhstan has set a limit of 50 GrahamStetzer units for electrical pollution allowed. The responsible party has to pay for remediation.

A drastic reduction in exposure guidelines was also proposed in 1995 for Italy by the Physics Laboratory, National Institute of Health. They proposed a reduction to 1 mG for residential and 5 mG for occupational exposure.

To quote from their report, entitled, “High Voltage Power Lines in Italy: Quantitation of Exposure and Health Risk Evaluation:” “New regulations have recently been proposed in Italy, both at national and regional level, aimed at preventing possible long-term health effects of magnetic fields from power lines. Based on some indications from the epidemiological literature, the proposed standards require the exposure limits to be reduced to values that are three orders of magnitude lower than recommended by IRPA/INIRC guidelines.”

Dr. Cherry's recommended public health protection standard for RF microwaves is 0.1 microwatts per sq. cm. He states that: "Every person is at risk of neurological effect from living, working or going to school in fields of 0.2 mG or more, I recommend the target limit chronic mean exposure level for children as 0.2 mG. This is not based on 0.2 mG being completely safe. No level of exposure to artificial oscillating fields is safe. The safe level of exposure to 50/60 Hz fields is zero.

For 50/60 Hz electromagnetic fields the recommended initial guideline is 1 mG A maximum limit value of 0.2 mG is recommended for the school environment. The desirable level in homes, schools and workplaces is 0.1 mG, the "Excellent" category. The 0.2mG level is in the "Good" category. People should aim to live in the "Good" to "Excellent" categories.

We need absolute proof positive of the harmful effects of EM radiation on living systems. We have it. The key is that the effects of radiation are CUMULATIVE – I repeat CUMULATIVE !!! IT CAN TAKE 10 – 20 – 30 or even more years for the damage to become apparent. It can even be handed down through generations. These things we know.

ALWAYS we must keep in mind that the results of radiation are CUMULATIVE over time.

We need measurements of total accumulated radiation over a specified period of time. Just as we did in the '60s when we wore personal dosimeters in the field locating sources of radiation. Just as Xray technicians and also people required to work in the Chernobyl (1986?) area must. We need to measure accumulated radiation. ("Motorola Funded Counter Research on Microwave DNA Damage", Dr. Neil Cherry, Associate Professor of Environmental Health, Lincoln University, 9th December 2002)

"Adding to the worry in the United States is the virtual blackout on good information for the public and for our decision-makers . Local governments and their communities are prohibited by federal law from even discussing radiofrequency radiation issues in the siting process, and may not ask for information. [This law was brought to you by the marriage of industry and politics. —Shivani]

There is presently no reliable way to get information on locations of cell sites, and levels of RFR they produce. In some communities, wireless carriers have been particularly successful in lobbying local governments to lease publicly-owned properties for sites. Therefore, there is a disincentive in making too many inquiries on behalf of the public they represent, for fear of incurring displeasure of their lessees. There may also be some liability issues that local jurisdictions incur, so that administrative records are intentionally kept "clean" of RFR health hazard and exposure level data.

Information should be overlain on a land use map showing nearest uncontrolled public access, distance to occupied buildings and designated land use for each building (home, school, daycare, pre-school, hospital, convalescent hospital or home, commercial office, shopping mall, etc) The purpose for generating this information is to allow the public to make reasoned judgments about whether and where to spend time at home, work, school and play with respect to chronic, low-level RFR exposure. Until better regulatory standards guide land-use compatibility decisions about whether and where to site new wireless transmitters, the public is obligated to perform its own detective work, become informed, and make personal choices about RFR exposure. At present, the circumstances generally make chronic, low-level RFR exposure involuntary by keeping information out of the public arena" ("Radiofrequency Radiation Information: What the Public Needs to Know for Wise Decision-making in Cell Siting" , Cindy Sage of Sage Associates)

The FDA's stated position: "It is generally agreed that further research is needed to determine what effects actually occur [from RFEMF exposure, ed.] and whether they are dangerous to people" (FDA 2002)."

The Consumer Affairs Commission (1999) found current thermal guidelines associated with EMR as irrelevant, since cancer and Alzheimer's are associated with non-thermal EMR effects.

The National Institute of Environmental Health Sciences (NIEHS) concluded on July 24, 1998, that extremely low frequency (ELF) electromagnetic fields should be regarded as possible carcinogens.

“The UK has allowed the highest output of radiation in the world. [Several microwave towers have been pulled down at night by desperate residents. —Shivani] It recently adopted lower levels of radiation, by accepting guidelines set by the International Commission on Non-Ionising Radiation Protection (ICNIRP). The ICNIRP standard, however, doesn't offer any form of protection other than from the heating effects of microwave radiation. In other words, the ICNIRP standard only protects your body from properties of high levels of elevated temperatures. A very substantial body of peer-reviewed science clearly shows that many biological changes have already happened.

The Government and Health Protection Agency Radiation Protection (HPA RPD) -formerly known as the NRPB now admit that magnetic fields at the power levels of 0.4 microtesla doubles the risk of contracting leukaemia, whilst other European Countries have brought down their power levels to 1 or 2 microtesla, the UK remain 100 times higher. They also admit that they have known about this for over three years.” (“Mobile Phone And Mast Radiation – How Dangerous Are These”, by Eileen O'Connor of The EM Radiation Research Trust, October 1, 2005)

The United Kingdom's National Radiological Protection Board urges that children should only use cellphones in emergency situations.

As stated by IEEE (Institute of Electrical & Electronic Engineers) International Standard IEEE 519- 1980, revised to the IEEE 519-1992, the electric utilities are legally responsible for the quality of the electricity delivered by their wiring, particularly regarding high frequencies and harmonics. This is an internationally standard accepted by the USA. It is not enforced.

[Rule 92-D of The National Safety Code accepted by the US, Canada and Mexico prohibits objectionable flow of current over the grounding conductor. However, Wisconsin PSC allowed electric utilities to ground all transmission and distribution poles in the '90s, in order to use the ground to return the current to the substations, rather than asking them to update their wiring to be able to properly return current to the substations via the wiring. As more and more current is added to the ground, the Wisconsin PSC raises the voltage allowed on the ground.

There is no such thing as “stray voltage.” Dogs stray. Electricity does not. “Stray voltage” is an absurd term concocted by the electric utilities & Public Service Commissions, which they define as only running through and affecting animals, not humans. Therefore, “stray voltage commissions” never have to consider complaints of human injury. Also, “stray voltage” is defined as being steady state, meaning just 60 Hz, whereas today's current contains many frequencies. Therefore, “stray voltage” cases cannot be won by farmers, because what is damaging their cows does not fit the definition of “stray voltage.” In fact, most of the damage is not due to electrical shock, but caused by the high frequencies. — Shivani]

In drafting....guidelines for....exposure to powerline frequency (50-60 Hz) EMFs, Australian authorities....have taken their maximum exposure guidelines from overseas expert groups, mainly the ICNIRP, which are as follows, (for magnetic fields over a 24 hour exposure):

For Residential Exposures: 1000 milliGauss (mG)

For Occupational Exposures 5000 milliGauss (mG)

....However....these guidelines are only designed to avoid immediate high level hazards and do not consider prolonged low-level exposures at all. This was admitted in 1991 by Dr. Keith Lokan, from the ARL in a conference paper published in Radiation Protection in Australia (Vol 9 No.4, 1991), referring to IRPA/INIRC guidelines which were taken over by the ICNIRP in 1993 and reconfirmed at that time.

To quote: ” These limits [as above] represent plausible field values, below which immediate adverse health effects are unlikely, and as such serve a useful purpose. They are NOT intended to provide protection against possible

cancer induction by continued exposure at the lower field levels implicated in the studies we have been considering at this workshop.” (1 – 3 mG)

ELECTRICAL POLLUTION

Health-damaging ELF frequencies we are exposed to due to the inappropriate design of the 50/60 Hz electrical transmission and distribution systems.

Low frequency electromagnetic fields, whose frequencies, harmonics and sub-harmonics coincide with the range of frequencies used by our brains, hearts and cells. Subtly and at extremely low intensities, they strongly interact, through resonant absorption, with primary functions of our bodies with significant elevations in depression, sickness and death. (Dr. Neil Cherry. See full text at: <http://www.esdjournal.com/techpapr/elfhealth.pdf>)

[“When these health-damaging frequencies ride on the “clean” 50/60 Hz current of our electric utility transmission systems, they are known as “electrical pollution.” After entering our buildings via wiring, water and gas pipes and phone lines, they broadcast from these filling our living spaces with frequencies that damage our health.

Body impedance of electrical current decreases and current passing through the body increases as frequency increases. We have good resistance to 50/60 Hz but less as the frequency increases. Above 1.7 KHz, all the energy dissipates internally into the human body.

Harmonics are multiples of 60 Hz frequency caused by electronics such as dimmer switches and transformers that chop up the sine wave. Our 50-year-old electrical transmission system was not designed to handle high frequencies, which are unable to return to the substation immediately from the point where they are created, due to the inadequacy of the present wiring. Instead, the harmful frequencies are passed along from customer to customer and also spilled onto the ground, like pressurized waste from a stressed sewer system. The system is grounded from end to end to facilitate this. In many areas of the US, 70% of current returns to substation on the ground, like a toxic chemical flowing over your private property. Livestock, which often stand on damp, very conductive, ground, are often severely damaged.

When I was on Wisconsin Public Radio recently, a Iowa veterinarian called in to report that since a new substation was constructed near a particular farm, there has been great trouble with the pigs there, which are apparently being literally cooked by the high frequencies in the ground currents that are concentrated in areas where they return to substations. He reported that one sow had a temperature of 114 just before she died. The liver of an animal that dies in this way appears upon examination to have been cooked just as you would cook liver in a microwave oven.”

For more information regarding electrical pollution, see also my article, “Electrical Pollution: What is it Doing to You and Yours?” and “Dirty Electricity & Electrical Hypersensitivity: Five Case Studies”, by Magda Havas and David Stetzer. —Shivani]

From GROUND CURRENTS: An important factor in electromagnetic exposure

By Duane A. Dahlberg, Ph.D.

“Today the earth has a higher conductivity than the utility’s neutral circuit return wires, and therefore, carries the majority of neutral current returning to the substation (Gonen 1986; Morrison 1963, Hendrickson, Michaud, Bierbaum 1995).

Substantial grounding grids are buried in the earth below substations. Electric currents in the ground that emanate from the grounding of the neutrals of the distribution lines and other sources converge on these grounding grids. Consequently greater ground currents are present near substations and in structures in their immediate vicinity. Ground currents also have a greater probability of being present in direct paths between large users of electricity and between these users and the substation.

In the case of 60 Hz electrical power, storage is not feasible. If the demand for electrical energy falls below the output of power plants, it may be necessary to shunt some electric current into the earth until the output is adjusted to match the demand. Current that is shunted into the earth adds to the ground current.

The grounding practice in the utility industry forces all living organisms to be continuously in physical contact with the electrical distribution system. The extensive grounding of the neutral in the distribution system also forces electrical currents to be present to a greater or lesser degree in all materials making up the environment of living organisms. Of course the living organisms, since they are themselves conductors of electricity and in contact with materials carrying electric currents, are basically plugged into the electrical circuitry of the distribution system.

Worldwide research and investigations of both animal and human health problems in dairy barns have demonstrated that small continuous currents (as low as a fraction of a microamp) can affect well being.”

[end Dahlberg quote]

The effect of grounding the electric distribution system to the earth is a national electric distribution system in which 65 to 75% of the current returns to the substations through the earth rather than through the wires. (Hendrickson 1995, Gonen 1986, Morrison 1963.)

The scientific research and advising body of the American electric utilities is EPRI, The Electrical Power and Research Institute. An EPRI study by Kavet, et. al, printed in *Bioelectromagnetics* 21:538-553 (2000), found that the contact current caused by the present system is very likely a cause of childhood leukemia. Contact current of as little as 18 microamps is implicated. Many of us are exposed to 30 times that much every time we touch our kitchen counters or other items in our homes.

Kavet's paper brings together ground currents and 60 Hz magnetic fields as co-contributors to leukemia in children. It is not surprising to draw this conclusion, since both magnetic fields and contact currents resulting from ground currents increase electric current in the body.

From RESEARCH ASSESSING THE IMPACT OF ENVIRONMENTAL AGENTS

By Duane A. Dahlberg, Ph.D.

“In electrical exposure, electric currents traverse the body of living organisms in direct proportion to the electric potential and the varied conductivity of the body. These currents in the body set up magnetic fields. If electric charge increases at a given point in the body, a localized electric field is produced.If one wishes to study chronic effects, however, it is necessary to know where the current is going in the living organism and how it interacts with each part of the organism. Living organisms are complex organic systems with ionic components. Resistance of organic systems is a complex function of many variables. Consequently a more general form of the Ohm's law is required. This form states that the current density in an object is equal to the conductivity times the electric field ($J=sE$). Conductivity, which is the reciprocal of resistivity, is obviously not a constant for organic and semi-conducting materials. In fact conductivity can be a tensor when electrical conductivity has different values for current traveling in different directions in a material. In the case of animal tissue, resistivity is dependent on the direction of current flow, the direction of the applied electric field, the magnitude of current density, and frequency. Some body materials have diode characteristics, and are able to rectify AC. Other parts may be piezoelectric and generate electric currents when stressed. In addition there are orders of magnitude differences in conductivity of different parts of the body. Fluids, in general, have higher conductivity and fibrous materials have lower conductivity.

When electrical potential are applied between two points on the body of an animal, the fraction of the current in each part of the body is directly related to the electrical conductivity of that part. It is possible to determine what portion of the current is in the nerve fibers or the vascular system, for example, but only if the relative conductivity of the entire body can be mapped. Since many molecular structures in the body are polar in nature, capacitance can vary throughout the body. These many molecular structures also have different magnetic properties that can, therefore,

have a different inductance. Predicting how current from an applied AC potential will vary from one part of the body to another requires knowledge of both capacitive and inductive reactance as well as conductivity. These complexities support the need to take a more general approach in the investigation of cause and effect from electrical exposure.

In a number of the laboratory research projects individual cows showed a significant decrease in milk production and other negative effects. There were also large variations among cows. The fact that cows responded differently suggests that there can be significant individual differences in observed effects from the same electrical exposure. This is consistent with the natural differences that occur in living organisms.

....Because of the complexities of any research involving environmental agents, and because of the power of vested interests in any technological development, the challenges to scientific research on the negative effects of electrical exposure are almost overwhelming.”

(end Dahlberg quotes)

[In a \$25,000-a-copy official Handbook EPRI advises the electric utilities to do remediation of their systems that would prevent electrical pollution, but the actual advice given by one of the authors, who addressed a gathering of national utility representatives shortly after helping write the Handbook, was “Stall as long as possible. Prepare for litigation.” (As recorded in a PowerPoint presentation.)

IEEE standard 519-92 of 1980 states utilities are responsible for high frequencies and harmonics on their lines. This is an international standard accepted by the USA. It is not enforced.

Rule 92-D of The National Safety Code accepted by the US, Canada and Mexico prohibits objectionable flow of current over the grounding conductor. However, Wisconsin PSC allowed electric utilities to ground all transmission and distribution poles in the '90s, in order to use the ground to return the current to the substations, rather than asking them to update their wiring to be able to properly return current to the substations via the wiring. As more and more current is added to the ground, the Wisconsin PSC raises the amount of voltage allowed on the ground. (Ground here meaning terra firma.)

There is no such thing as “stray voltage.” Dogs stray. Electricity does not. “Stray voltage” is an absurd term concocted by the electric utilities & Public Service Commissions which they define as only running through and affecting animals, not humans. Therefore, “stray voltage commissions” never have to consider complaints of human injury. Also, “stray voltage” is defined as being steady state, meaning just 60 Hz, whereas today’s current contains many frequencies. Therefore, “stray voltage” cases cannot be won by farmers, because what is damaging their cows does not fit the definition of “stray voltage.” In fact, most of the damage is not due to electrical shock, but caused by the high frequencies. — Shivani]

Reported in Shocking News October 26, 2004:

[Indication that it was specifically the high frequencies that created leukemia in the famous Wertheimer study of 1979: -Shivani]

“Electrical engineers and epidemiologists re-examined the EMF-cancer hypothesis by measuring the current (amperes) at the utility neutral-to-ground wire at the transformer or pole near the homes, the amperage on water lines serving the homes, and the intensity of magnetic fields in the living areas most occupied by victims who had lived in the homes. BTDC sampled 81 of the 579 cases (cancer) and control residences that were coded by Wertheimer and Leeper in 1979 [20] and by Savitz et al. in 1988 [In ref. 11]. In this study 60 Hz, 180 Hz, and harmonic magnetic fields are associated with wire codes, but only 180 Hz and harmonic magnetic fields are associated with case/control status; case being a cancer victim lived at the residence.

The odds ratio (OR) combined across strata (HCC, LCC) for the 180 Hz and the sum of 3rd , 5th , and 7th harmonic

fields were 4.0 and 4.3 respectively. Both were significantly elevated above the null value of 1 ($P = 0.0061$) for either field components. The odds ratios indicate cancer deaths were four times more likely among victims who lived in homes with high levels of 180Hz current or the 3rd , 5th and 7th harmonics than among controls with similar socioeconomic backgrounds. The conclusions reached 25 years earlier [20] were validated, but an improved measurement instrument with coil sensor signal analyzer (HP Model 3561A) implicated harmonic currents which earlier test meters did not detect.

[180 Hz is a 3rd harmonic frequency that becomes an additive on 3-phase wiring. This means that once on the wiring it keeps adding its higher harmonics, up and up into higher frequencies. — Shivani]

Why Ground Currents

By Duane A. Dahlberg, Ph.D.

E. Stanton Maxey, M.D., through a Freedom of Information action, received the raw data from a National Cancer Institute study (Linnet, et.al. 1997) in November 2000. With the help of mathematicians he reanalyzed the data and has concluded that the NCI raw data reveals approximately a 3,000,000,000,000 to one probability that elevated 60 Hz magnetic fields are in some manner causal to childhood ALL.

John Douglas published a 1993 article in the EPRI Journal summarizing an EPRI nationwide EMF survey of sources of 60 Hz magnetic fields in homes. One of the findings was that electric current in water pipes and other grounding paths may be the largest non-appliance magnetic field source in the home (Douglas 1993).

Wertheimer, Savitz, and Leeper published a paper in 1995 that found an association between cancer and conductive plumbing in residences. They found that measurements made in these residences suggest an increased cancer risk for persons who live with elevated magnetic fields from ground currents (Wertheimer, et.al. 1995).

From Havas & Stetzer Study, as reported in Shocking News, October 26,2004. Full text and graph can be downloaded at www.getpurepower.ca/resources /www.getpurepower.ca/resources/ .

“...Blood plasma glucose of diabetics increased as measures of electricity (millivolts and microsurgers) increased in the environment of patients diagnosed with diabetes. Fasting glucose increased from 100 mg/DL to 160 mg/DL as electricity in the environment increased from 0 to 60 millivolts (mV).”

“...reducing electrical pollution (high frequency electrical noise) by use of microsurge filters plugged into [Refers to Stetzer filters.] wall outlets resulted in blood glucose decreasing within minutes. Fasting blood sugar decreased from average 171 to 119 mg/DL.”

Dr. Magda Havas, a professor of the environmental and resource studies program at Trent University in Peterborough has recently presented a paper to the WHO suggesting, based on the results obtained when filters were installed in subjects homes, that ES may have an association with diseases such as multiple sclerosis and diabetes. A subject in one of her studies, Brad Blumbergs, 28, was diagnosed with MS at 25. He required assistance when walking, and he'd lost 30 pounds he couldn't afford to lose. Three days after filters were installed in his house, he was walking unassisted. Two weeks later, he was shoveling snow. [See paper at Resources]

Results of filtering a school

[Following are two letters to the school board of Melrose, WI from their district nurse. She is referring to the Graham/Stetzer filters that are plugged into outlets to remove the health-damaging high frequencies polluting the current in homes, schools, offices, etc. Only when the RF (radio-frequency pollution) is removed do people begin to realize the effects it has been having on them. — Shivani]

CHANGES NOTED SINCE FILTERS INSTALLED

In the years previous to the filters being installed, several children required inhalation treatments for their asthma in the spring and in the fall. Many of them required nebulizer treatments once or twice a day while at school. I have not had to administer one nebulizer treatment this past year and of the 37 students with inhalers, only three of them use the inhaler for their exercise-induced asthma before Phy Ed.

Teachers are stating they are less fatigued and tired.

The sense of smell has come back for me. I lost it for three years and the doctors said it was my allergies.

The students seem to have more energy and appear and seem less tired.

Several staff who doctored regularly for allergies have not had to take medication or see their doctor because they are having less problems.

Students whom have been diagnosed with migraine headaches have had their headaches reduced or have no headaches at all.

I feel that our faculty and students have had improved health overall since the filters have been installed.

Char Sbraggia R.N.
District Nurse

[Ms. Sbraggia also wrote a two-year follow-up report, 1-14-05 — Shivani]

TWO YEARS FOLLOWING THE INSTALLATION OF THE GRAHAM/STETZER FILTERS

I am the schools district nurse and have been for the last 15 years. We have had the filters for the last two years. It is my opinion that our students, our teachers and all of our support staff are much healthier than before the filters were installed. This can be checked and verified by looking at our absences because of illness records.

Our asthmatics continue not to need neb treatments, have had no episodes at school requiring emergency treatment, and seem much healthier. Our students continue to have more energy.

All of the statements I presented in the first letter remain in effect. It is my opinion that we are a much healthier school since the filters have been installed.

If you want to experience this change, just try the filter for a few weeks and see if you don ' t experience a difference.

Char Sbraggia R.N.
District Nurse

[As reported by Angela Olstad, fourth grade teacher and building principal at the Mindoro school, the staff suffered from unexplainable health conditions for years. The list of symptoms includes fatigue, memory loss, facial flushing, rashes, headaches, numbness, loss of taste and smell, eye irritation, depression, sleep disturbances, double vision, asthma difficulties, sinus infections, and bronchitis. These health conditions began when school started and gradually went away throughout the summer months.

Angela herself had experienced a drastic change in her health soon after coming to the Mindoro school. The whole right side of her body went numb. She had terrible headaches, vision problems and felt completely exhausted at the end of a work day. She was unable to teach for an entire week without calling in sick After taking a day or two off, she would begin to recover over the weekend and she'd be back at work on Mondays. She was diagnosed with MS.

When the school hired Dave Stetzer to remediate the situation she actually accosted him in a hallway, yelling that

they had already cleaned the ductwork to no avail, and she was sure this was going to be a waste of time and money too. A few weeks later she apologized, telling Dave her health was dramatically improved, as well as that of many students and other staff members. Many of the other teachers have also installed electrical filters in their homes

Dave Stetzer recently spoke before the Wisconsin School Board convention about the hazards of electrical pollution. Blair-Taylor, CFC, Brighton and Marshfield schools now have filters installed at each school building.

At Electrical Pollution.com you can click on a link on the main page to see an oscilloscope printout of an actual waveform (at right) in a Minnesota school classroom prior to remediation. A teacher in the room where the reading was taken had died of brain tumors, and the teacher in the adjoining room died of leukemia. The frequencies found were stated to be carcinogenic by Dr. Vitaly Reznik, head of sub-faculty of hygiene and epidemiology of the High School of Public Health, Kazakhstan.

Kazakhstan has passed a federal regulation limiting electrical pollution to 50 GS units. A generally symptom-free level is 20. American homes commonly have 200 to 1,800 units, and some have more. Consumers should be receiving clean current, not polluted current that we have to clean up to save or recover our health.

[INSERT WAVEBIG.JPG IMAGE]

Rep. Barbara Gronemus (D) – Whitehall, WI introduced legislation (bill AB529) that would require something to be done about electrical pollution. . So many residents affected by electrical pollution wished to testify that a hearing in Madison took all day and well into the evening. However, Wisconsin's political situation has kept the bill in committee. – Shivani]

....OSHA Directive CPL 2-1.18A – Enforcement of the Electric Power Generation, Transmission, and Distribution Standard, Effective Date: October 20, 1997, states as follows: “Hazardous energy means a voltage at which there is sufficient energy to cause injury.

[Since energy increases tremendously at higher frequencies, a small voltage is sufficient to cause damage to living bodies. The higher the frequency, the less resistance we have to it. Above 1.7 KHz all the energy dissipates internally into the human body. Therefore , electrical pollution fits the OSHA definition of hazardous energy . “Personally, I am sensitive to .01 volts per meter if electrical pollution is present.”
—Shivani]

ELECTRICAL SENSITIVITY

How the body reacts to manmade electromagnetic radiation, research and governmental response
[This quote is from a letter Professor Olle Johansson wrote to Omega News, and can be read in entirety at <http://omega.twoday.net /stories/1137186/> — Shivani]

“My working hypothesisis that electrohypersensitivity is a kind of irradiation damage, since the observed cellular changes are very much the same as the ones you would find in tissue subjected to UV-light or ionizing radiation

One very fierce criticism from certain ‘opponents’ has been that such mast cell alterations in persons with electrohypersensitivity (or in normal healthy volunteers!) can not be due to the action of electromagnetic fields (EMFs) and/or airborne chemicals, but must be due to psychological or psychiatric personality disturbances, cognitive malfunction, or likewise. The purpose and objective of the present study was – therefore – to determine whether rat mast cells in skin and thyroid gland, as well as cutaneous nerve fibers and eosinophils, are sensitive to the influence of power-frequent EMFs.

In summary, it turned out that the numerical and volume densities of intact type A mast cells in the thyroid of the exposed group of rats were significantly higher as compared to the control ($p < 0.05$ for both). [N.B. The obtained

animal results can not be understood by psychological or psychiatric theories, but are claimed to be due only to the EMF exposure.” Olle Johansson, Assoc. Professor, The Experimental Dermatology Unit, Department of Neuroscience, Karolinska Institute, 171 77 Stockholm Sweden.

[Professor Johansson also explains that mast cells produce the chemicals that cause itchiness, asthma, and allergy symptoms, as well as cardiac effects. He says that in Sweden ES people have been psychologically tested and found to be normal, and that rats and cells don't get psychosomatic symptoms. He found that one extremely sensitive woman actually lacked a particular protective layer of skin. Without that biopsy, how many doctors around the world would have assumed she had psychological problems? —Shivani]

” From the results of recent studies, it is clear that electromagnetic fields affect the mast cell, and also the dendritic cell, population and may degranulate these cells. The release of inflammatory substances, such as histamine, from mast cells in the skin results in a local erythema, edema and sensation of itch and pain, and the release of somatostatin from the dendritic cells may give rise to subjective sensations of on-going inflammation and sensitivity to ordinary light. These are, as mentioned, the common symptoms reported from patients suffering from electrosensitivity/screen dermatitis. Mast cells are also present in the heart tissue and their localization is of particular relevance to their function. Data from studies made on interactions of electromagnetic fields with the cardiac function have demonstrated that highly interesting changes are present in the heart after exposure to electromagnetic fields.. One could speculate that the cardiac mast cells are responsible for these changes due to degranulation after exposure to electromagnetic fields.” (Prof.Olle Johansson, from personal correspondence, 12/05).

Excerpted from an article by Tyler Hamilton in the Toronto Star, 11/11/05

“Prof. Johansson finds that people are becoming sensitive to lower and lower Specific Absorption Rates as the years pass. He explains that the wavelength of the presently-used communications frequencies resonates very well with the length of our bodies, and suggests we would be wise to switch to much longer wavelengths. Presently, he finds Swedes reacting to SARs 100,000 times lower than what is allowed in Sweden. (KPFA radio interview 11/29/05)

The issue of electrical sensitivity first gained a profile in 2002 when Dr. Gro Harlem Brundtland, then director-general of the World Health Organization, confirmed in a media report that she banned cellphones from her office because they gave her headaches.

Brundtland, a medical doctor and former prime minister of Norway, told the Star during a visit to Toronto ...that the condition needs to be taken more seriously by health authorities, and that little is known because research to date has focused largely on the potential links between electromagnetic frequencies and more severe illnesses, particularly cancers.

Dr. Magda Havas, a professor of the environmental and resource studies program at Trent University in Peterborough , is one of the few trying to track the condition in Canada .

Havas estimates as much as 35 per cent of the population may be suffering from moderate ES, with the severe form Bandera experiences affecting 2 per cent. She speculates that ES may have an association with diseases such as multiple sclerosis and diabetes. [See Resources]

‘MS and diabetes are both on the increase and I wonder how much of this is due to dirty electricity and our inundation with radio frequency radiation,’ says Havas, who has experimented with filters that help block what she calls ‘electropollution.’

‘I have videos of MS patients who walked with a cane and can now walk unassisted after a few days or weeks with the filters.’

Sweden acknowledged ES as a physical impairment in 2000. Official statistics from the Swedish National Board of Health and Welfare: 220,000 in the year 2001, but extrapolated to today to be up to 300,000. This is 3% of the Swedish population which today is 9,000,000 people. With an estimated 300,000 sufferers. Swedish employees can request special computer monitors and lighting fixtures that dramatically cut down frequency emissions. Residents of some municipalities can get their home 'sanitized' from electromagnetic frequencies. If these alterations turn out not to be optimal they can rent small cottages in the countryside owned by the Stockholm municipality, which also intends to build a village with houses that are specially designed for persons who are electrohypersensitive."

Austrian scientists Dr. Gerd Oberfeld sent out a press release 1 May 2005 with this report: 'A study in Austria examined radiation from a mobile phone mast at a distance of 80 metres; EEG tests of 12 electro-sensitive people proved significant changes in the electrical currents of the brains. Volunteers for the test reported symptoms like buzzing in the head, palpitations of the heart, un-wellness, light headedness, anxiety, breathlessness, respiratory problems, nervousness, agitation, headache, tinnitus, heat sensation and depression.'

The Sunday Times -Britain, September 11,2005

"A GOVERNMENT agency has acknowledged for the first time that people can suffer nausea, headaches and muscle pains when exposed to electromagnetic fields from mobile phones, electricity pylons and computer screens.

The Health Protection Agency has now reviewed all scientific literature on electrosensitivity and concluded that it is a real syndrome. The condition known as electrosensitivity, a heightened reaction to electrical energy, will be recognised as a physical impairment."

Comment from Powerwatch

"On the 28th October, the HPA published another report on the burden of disease in the UK, that included: 'A small percentage of the population may express an increased sensitivity to a range of electric and magnetic fields with symptoms including: skin sensitivity, dizziness, headache and fatigue. This has not been quantified but the symptoms and increased levels of stress and anxiety will contribute to health costs ' . This is a tacit acknowledgement of the problem of EHS, and its possible implications for an overburdened health service. So, what is being done to investigate it?

....when Mike Repacholi (of WHO's EMF project) was recently reported in New Scientist (10th September 2005, page 14) as saying that 'the worst effects of the Chernobyl nuclear accident are mental health problems brought on by too much worry', we do have to wonder what is going on in the minds of the people in charge of investigating these matters.

Perhaps a clue could be a sentence, discussing potential future research, from an HPA representative in a paper delivered at the Electrical Hypersensitivity Workshop in Prague, 2004: 'An acceptance that EMF has a causal role in ES would have widespread implications for future policy on prevention and management.' Maybe the HPA know that the report is going to show EHS to be a real, debilitating health condition that is affecting a significant proportion of the country's population? They are fully aware of the likelihood that the public will want someone to be held accountable, not only for the causation of the problem, but for providing the solution. Is it this accountability that they are trying to avoid? Of course , if the government's Health Protection Agency are unwilling to be accountable for the protection of the UK population's health from the effects of EMFs, who will? Surely that is what the HPA is for?"

[The California Dept. of Health Services did a survey in 1998 indicating that 120,000 California residents were so disabled by electromagnetic pollution that they were unable to work. By implication, this extrapolates to 1 million Americans. For instance, if half of Milwaukee 's population are adults, that is 12,000 people. — Shivani]

"The Access Board is our federal agency responsible for overseeing compliance with the Americans with Disabilities Act. In 2003 the Board contracted with the National Inst. Of Building Sciences to develop recommendations about indoor environmental quality. These recommendations, published in July of 2005, address for the first time the

needs of persons disabled by electromagnetic radiation: 'For people who are EM sensitive, the presence of cell phones and towers, portable telephones, computers, fluorescent lighting, unshielded transformers and wiring, battery re-chargers, wireless devices, security and scanning equipment, microwave ovens, electric ranges and numerous other appliances can make a building inaccessible.'

The National Institute for Occupational Safety and Health (NIOSH) notes that scientific studies have raised questions about the possible health effects of EMF's. NIOSH recommends the following measures [Not here quoted. – Shivani] for those wanting to reduce EMF exposure – informing workers and employers about possible hazards of magnetic fields, increasing workers' distance from EMF sources, using low-EMF designs wherever possible (e.g., for layout of office power supplies), and reducing EMF exposure times .

The Committee acknowledges that while the scientific evidence may be inconclusive about whether ambient electromagnetic fields pose a substantial health risk to the general population, the presence of EMF is an access barrier for people who are electromagnetically sensitive. Therefore, the Committee recommends that measures be taken to reduce EMF whenever possible in order to increase access for these individuals as well as taking a precautionary approach to protecting the health of all." (National Institute of Building Sciences (NIBS) IEQ Final Report 7/14/05).

11/03/05 letter to editor of the Toronto Star, from Dr. Magda Havas

"New 'smart meters' will provide information about how much energy each home and business uses on an hourly basis. This information will be transmitted 24 hours a day through a combination of phone lines, power lines, and wireless radio frequency transmission just so we can monitor when we use electricity. Proposed frequencies range from 200 MHz (million cycles per second) to 1.4 GHz (billion cycles per second). These radio waves are then added to the pool of existing radio frequencies that are generated by cell phone antennas and broadcast antennas.

...Epidemiological studies from Israel, Germany, Netherlands and Spain document a greater risk of cancers and symptoms now classified as electrosensitivity (ES) for people who live 400 meters of cell phone antennas. The frequencies for cell phone antennas range from about 800 MHz to 2 GHz and overlap with those proposed for smart meters.

...No one wants to be put at a greater risk of developing cancer and people with ES certainly don't want to be exposed to more radiation.

With smart meters we are going to be exposed to more radio frequency radiation to save money in the form of energy. How much will it cost for additional health care, hospital stays and time off work? Will the money we save be worth the price we pay? I don't think so."

[An electrohypersensitive woman from Milwaukee called in to Ben Merens's radio program when I was on, to describe how she was sent reeling the moment she opened her front door, when coming home for the first time after a "smart meter" had been installed without her knowledge. She has pleaded with the utility company to remove it, to no avail. She has since called me to describe her progressive disability.

As pointed out by Dr. Havas, Professor Johansson, and others, electrical sensitization is similar to chemical sensitization in that it can be caused by over-exposure and appears to be more or less permanent. Even a small exposure can result in severe symptoms whenever a sensitized person is re-exposed to the stressor agent. The industries responsible for overexposing large populations to electromagnetic frequencies that interfere with the internal communications of living organisms may soon discover they have created generations of people who cannot bear the proximity of their products. Dr. Havas and Professor Johansson suggest that the wireless industry would be wise to begin the move to longer, hopefully less biologically active, wave-lengths as soon as possible. —Shivani]

WiFi

Why Wireless fidelity computer networks are a danger to health

Hundreds of studies have already demonstrated the severely deleterious health effects of living near radio and microwave broadcast towers. (See Research)

Also, review the information on irrelevance of present SAR standards.

The United States Environmental Protection Agency (EPA) itself acknowledges that current Federal Communications Commission (FCC) radiation protection standards are inadequate and do not account for all possible harmful effects of RFR, in particular the non-thermal effects that are of particular relevance to the radiation utilized by WiFi. In a July 16, 2002 letter from Norbert Hankin of the EPA's Center for Science and Risk Assessment, Radiation Protection Division to Janet Newton, President of The EMR Network, Mr. Hankin writes : "The FCC's current exposure guidelines, as well as those of the Institute of Electrical and Electronics Engineers (IEEE) and the International Commission on Non-Ionizing Radiation Protection, are thermally based, and do not apply to chronic, non-thermal exposure situations."

WiFi creates a chronic, non-thermal exposure situation.

Swedish doctor Leif Salford has shown that "low power broadcasts can be more damaging than higher power ones, depending on frequency, modulation, coherence, bandwidth and other properties of microwave radiation." Therefore, WiFi broadcasts, which are lower power than cell phone broadcasts, may actually be MORE damaging.

"Another familiar piece of misinformation that needs to be addressed is the assertion that the emissions of a Base-station are comparable 16 to that of only a 60W light bulb, and thus equally harmless. Quite apart from the fact that a 60W light bulb can be harmful to a person with photo-sensitive epilepsy, if it is flashed at an appropriate rate, the comparison is solely based on intensities, and neglects three important points:

(i) The fact that more than one carrier is always emitted. Thus, the figure of 60W must be multiplied by the number of carriers that are actually transmitted in any particular case; in order to minimize inter-carrier interference, however, this number is restricted typically to 4 at the most, whence the total output wattage can be as high as 240W.

(ii) The beams, however, are not emitted uniformly in all directions, but are instead concentrated in specific directions, the degree of directional focusing being quantified through the so-called 'gain' (G) of the antenna, typical values of which, in the case of GSM, range from about 40 to 60 [2]. (This applies even in the case of so-called 'omni-directional' antennae, which emit beams that are omni-directional only in the horizontal plane; in the vertical plane, the beam is directionally orientated by an amount that is determined by its vertical (angular) width – typically, about 10 degrees.) Accordingly, to calculate the power density (intensity) at a distance d from the mast using the familiar 'inverse square law', the power, P , delivered by the antenna must be multiplied by the gain, G, whence the intensity is given by the formula: $PG/4\delta d^2$; ; thus in the above example with P = 60W and G = 30, the effective directionally focused power (per single carrier)

– the so-called 'isotropic radiated power' (EIRP), given by the product PG – is 1800W, which is further increased to 7.2kW if 4 carriers are transmitted – a value that is 120 times higher than the 60W cited! The maximum EIRP value permitted by law is 1500W per carrier , whilst the maximum number of carriers is 16 (at 1800MHz) and 10 (at 900MHz); in practice, however, the number of carriers is usually restricted to 4 at the most, for the reason mentioned above.

(iii) The comparison neglects the all important frequency dimension, in particular the difference in the frequency that characterizes the visible light from the light bulb from that which defines the radiation to be (invisible) microwave radiation. For whilst the output from such a bulb is, during the day 17 , completely negligible in comparison with visible light of natural origin – i.e. that from the Sun – this is not so in the case of the microwave radiation emitted by a Base-station antenna day and night, which, several hundred of metres away, is typically 10 billion (10⁹) times higher than the microwave radiation that is emitted by the Sun at the same frequency. Accordingly, the emissions of

telecommunication Base-stations have caused an enormous (and relatively sudden) alteration in the natural environment (at this frequency) from that in which life on Earth has, over a very much longer time, evolved. The impact of this altered environment on biology is further enhanced by the high coherence of the Base-station radiation, as already noted in Para.2.” (How Exposure to GSM & TETRA Base-station Radiation can Adversely Affect Humans, by G J Hyland, Associate Fellow Executive Member, Department of Physics, International Institute of Biophysics, University of Warwick, UK Neuss-Holzheim, Germany)

[...

* Stress-response proteins produced by the body to repair cellular damage have been detected after .001W/kg SAR exposure (dePomerai et. Al. 2000)

* Calcium ion efflux is detected at .005 W/kg SAR. (Dutta et al, 1989)

* DNA damage has been detected at .006 W/kg. (Phillips et al 1998)

* The blood brain barrier of mice leaked at .004 W/kg. (Persson et al 1997)

However, United States ‘ RF radiation exposure guideline for the public is .08 W/kg., the ICNIRP standard is 2 W/kg, and the FCC SAR level set for cellphones is 1.6W/kg.

What will the SARs created by the WiFi system be? What will local SARs be after the WiFi radiation is added to the radiation already present from RF/MW towers, radar, etcetera? Has this been mapped?

An independent licensed RF engineer can make power density predictions which would then have to be followed up by actual field testing using full-spectrum RF meters, also done by licensed RF engineers.

The mapping must consider the overlapping radiation from all present RF/MW towers, radar, etc. Present SARs can only be determined by taking actual readings in every area to be affected, perhaps at 300 foot intervals throughout the entire area. —Shivani]

Information that is generally required to conduct RFR (radiofrequency radiation) Assessments includes

* antenna transmitter location

* the number of transmitters operating simultaneously

* the frequency of each transmitting antenna

* the number of channels (radios) per antenna

* the effective maximum radiated power (ERP) for each channel and the expected radiated power for each channel

* the direction of each antenna (show vertical plane pattern)

* downtilt of antennas should be taken into account in calculations

* operational characteristics (communication? Wireless data?)

* a topographic map showing location of the site and of surrounding buildings

* the number of occupied stories and heights of each floor of buildings

* RFR contours should plot ERP at one meter and three meters above ground level, and establish AGL reference points to take ground elevation changes into account

* RFR contours depicting the maximum power density, and contours showing the 100, 50, 20, 10, 5, 2, 1 0.1 and 0.01 $\mu\text{W}/\text{cm}^2$ should be calculated and mapped for the proposed project installation

* RFR contours depicting the maximum power density, and contours showing the 100, 50, 20, 10, 5, 2, 1 0.1 and 0.01 $\mu\text{W}/\text{cm}^2$ should be calculated and mapped for cumulative power density from all co-located transmitting antennas.

* Information should be overlain on a land use map showing nearest uncontrolled public access, distance to occupied buildings and designated land use for each building (home, school, daycare, pre-school, hospital, convalescent hospital or home, commercial office, shopping mall, etc)” (“Radiofrequency Radiation Information: What the Public Needs to Know for Wise Decision-making in Cell Siting” , Cindy Sage of Sage Associates)

The Naila Study, Germany (November 2004) – This study, conducted over 10 years was released by The Federal Agency for Radiation Protection, Germany. Medical doctors compiled case histories since 1994 – 2004, looking at heightened risk of taking ill with malignant tumours. They discovered a threefold increase after five years exposure to microwave radiation from a mobile phone mast transmitter for up to 400 metres distance, compared to those patients living further away.

“The citywide WiFi system now planned for Milwaukee, Wisconsin, USA would provide approximately 3,000 such broadcasting antennae. As Arthur Firstenberg has calculated, the maximum distance of anyone in the area from a tower would be about 700 feet, and an individual’s “best-case” scenario would be to have 4 towers each about 700 feet away. Arthur points out that of course some people would just happen to have a broadcaster right outside their home, and that a WiFi broadcaster 20 feet from a home is about the equivalent of a microwave tower 600 feet away, roughly 200 meters.” [Please reread the statistic immediately above!] –Arthur Firstenberg

[The planned system is Broadband, with frequency hopping. This means that the frequencies the residents will be exposed to will be multitudinous, and changing at a rate of perhaps 150 times a second. Given the extreme electro-sensitivity of living organisms, the effects of this may prove horrendous. Residents will be unwilling guinea pigs in a very high-risk experiment.

The proposed WiFi broadband initiative is not subject to federal preemption of consideration of health and environmental issues, as WiFi operates in an area of the electromagnetic spectrum currently unlicensed by the FCC and not subject to the Telecommunications Act of 1996.

A City’s duty is to protect the health, safety and welfare of its citizens, including protection from the potential health and environmental impacts of pervasive, low-level modulated microwave radiation. If the City has adapted the Precautionary Principle, this virtually mandates that such considerations be taken into account.

It has been found in populations studied to date that 30 to 50% of individuals have electrical sensitivity resulting in symptoms, while 3% have electrical hypersensitivity, causing disabling symptoms resulting in inability to work. Presuming that half of Milwaukee’s population of 600,000 is adult, 3% translates to 18,000 people with disabling symptoms resulting in inability to work.

It has also been noted that as a population’s exposure to electromagnetic radiation accumulates and increases, sensitivity increases and begins at ever-lower levels of exposure.

Electromagnetic exposure in Milwaukee is already at strong stress levels. Those making the decisions would do well to pause for education and compassionate contemplation before adding the all-encompassing blanket of WiFi electrosmog to residents’ stress.

The United States Environmental Protection Agency (EPA) itself acknowledges that current Federal Communications Commission (FCC) radiation protection standards are inadequate and do not account for all possible harmful effects of RFR, in particular the non-thermal effects that are of particular relevance to the radiation utilized by the WiFi network proposed. —Shivani]

“Launching a virus into the wild has never been easier and more anonymous than it is today. . . . Even a robustly secured wireless access point can be cracked in a matter of hours.

Given how easy, anonymous and financially rewarding hacking and Internet theft have become, how many security personnel are you prepared to pay for to ensure that your WiFi network does not become a magnet for every industrious criminal enterprise across the country or around the world? In short, to truly secure a wireless network is an extremely expensive and complex task.” (From the 9/28/05 letter to San Francisco mayor Newsom, written by Doug Loranger on behalf of the San Francisco Neighborhood Antenna-Free Union (SNAFU), a grass-roots, city-wide coalition of community organizations and individual residents, to express strong, unequivocal opposition to a San Francisco wireless fidelity (“WiFi”) broadband initiative.)

[Milwaukee, San Francisco and other cities considering citywide WiFi would do well to consider the possibility of being remembered as having thoughtlessly jumped on the WiFi bandwagon at the expense of both the security and well-being of the city's residents. — Shivani]

“I have no doubt that at the present time the greatest polluting element in the earth's environment is the proliferation of electromagnetic fields.”

Robert O. Becker, M. D., Author of “Cross Currents and The Body Electric”

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