

of a literature survey that overwhelmingly indicates both the adverse impact of electromagnetic radiation on the average person's health and the existence of a segment of the population that is hypersensitive to electromagnetic radiation, including radiofrequency radiation such as is emitted by cellular phone transmitting antennas. I beg to refer to a copy of the Bergqvist and Vogel (1997) study, upon which, marked with the letters "AFS 10", I have signed my name prior to the swearing hereof.

O. The same author, Bergqvist, in a non-peer-reviewed setting, is the source of Drs. Bailey and Erdreich's conclusions about the shortwave transmitter near Berne, Switzerland (their Report, paragraph 14). This shortwave transmitter at Schwarzenburg was the subject of an official epidemiological study commissioned by the Swiss government in response to continued health complaints over a 20-year period by the residents of the surrounding community (Abelin et al. 1995). The complaints are identical to those being reported from all over the world to the Cellular Phone Taskforce: insomnia, weakness, nervousness, joint and limb pain, disturbed concentration, heart palpitations, cough and sputum, shortness of breath, headache, dizziness, etc. The leader of the study, Theodor Abelin, is a medical doctor and the Head of the Department of Social and Preventive Medicine at the University of Berne. The 404 people who participated in this study underwent a health interview and personality tests, and kept health diaries during the summers of 1992 and 1993. Blood pressure and urine melatonin levels were also measured.

The results of this study, as Dr. Josef Mayr pointed out in the September/October issue of Microwave News, are sensational. Insomnia, nervousness and restlessness, limb and joint pain, general weakness and tiredness, cough and sputum, and abnormal blood pressure were found to be more frequent within 1.5 kilometers of the transmitter. Sleep

interruptions were found to be directly associated with the electromagnetic field strength of the transmitter, and sleep quality improved during a 3-day transmission shutdown, of which the study participants were not informed. The overall promotion rate of children from primary to secondary school during the 40 years of operation of the transmitter has been lower at a school near the transmitter than at one distant from it. Health effects were found even at average exposure levels of 38 nanowatts per square centimeter, which is more than 5,000 times lower than the international standard. I beg to refer to a copy of the Abelin (1995) study, upon which, marked with the letters "AFS 11", I have signed my name prior to the swearing hereof.

P. A followup study by the same team has confirmed that sleep disturbances are strongly associated with exposure and distance from the transmitter, and that interference with sleep is occurring even where the average exposure levels are 2 nanowatts per square centimeter. This is 100,000 times lower than the international standard. I beg to refer to a copy of a poster abstract of this forthcoming study by Altpeter et al., upon which, marked with the letters "AFS 12", I have signed my name prior to the swearing hereof.

Q. A third, pilot study on cows in the area showed that stopping the transmitter was associated with a rise in melatonin levels in saliva, and that cows exposed to an average of 0.1 microwatts per square centimeter showed a phase shift in their daily melatonin cycle compared to unexposed cows far from the transmitter. I beg to refer to a copy of this study by Stärk et al. (1997), upon which, marked with the letters "AFS 13", I have signed my name prior to the swearing hereof.

R. As a result of the Schwarzenburg research, the Working Group on Non-Ionizing Radiation for the FOEFL

(Federal Office of Environment, Forests, and Landscape)-- the very group which had previously recommended adopting the ICNIRP limits in Switzerland--changed its opinion and now regards these limits as not protective against chronic exposure. The FOEFL itself has recommended a nightly shutdown of the Schwarzenburg transmitter, and I understand Telecom of Switzerland is planning to remove the transmitter from Schwarzenburg in March 1998. I beg to refer to copies of the Opinion of the Working Group, in German and in English translation; the letter from the Director of FOEFL to the Schwarzenburg citizens group SchoK, in German and in English translation; and a letter of 8 December 1997 from Dr. Abelin; upon which, marked with the letters "AFS 14", I have signed my name prior to the swearing hereof.

S. In paragraph 15 Drs. Bailey and Erdreich rely on three studies, which I will address in turn.

(a) The citation to Djordjevic et al. (1973) is not the one given in their reference list. The article they cite in their reference list (Djordjevic 1979 [sic]) reports on an experiment on rats at an exposure level of 5 milliwatts per square centimeter, which is a very high exposure level and is not relevant to the levels which will come from the proposed Esat base station. This study also does not describe the experimental conditions, so it is not known whether the controls were near enough the microwave generator to be affected by it--a possibility that is strongly suggested by the observation of leukocytosis in both the experimental and the control animals during the exposure period. I beg to refer to a copy of the Djordjevic (1977) study, upon which, marked with the letters "AFS 15", I have signed my name prior to the swearing hereof.

(b) The Lilienfeld (1978) study is a 450-page book which evaluates the health of employees at the U.S. embassy in Moscow which was irradiated by microwaves at an intensity of up to 15 microwatts per square centimeter beginning in

1953. This study's negative conclusions do not accurately reflect the data that it contains. To interpret them properly, one must realize that if microwave beams were aimed at any part of the embassy, no part of the embassy was "unexposed." Microwaves bounce off walls and penetrate them, are conducted through plumbing and wiring, and are re-radiated from metal objects. It is extremely difficult to design a room that shields them out. Therefore all references in this study to "unexposed" workers in Moscow must be read as "less exposed." The exact measurements are not contained in the 450 pages. The relevant data, hidden in Tables 6.20, 6.21, 6.31, 6.32, 6.34, 7.20, and 7.23, are spectacular. Male employees in the Moscow embassy developed symptoms more often than male employees in other Eastern European embassies in 19 out of 20 symptom categories. Furthermore, for the 21 most frequent medical diseases among the Moscow female employees, the incidence was higher in the Moscow embassy than in other embassies in 18 of the 21 conditions. Among male employees, the rates were higher in Moscow in 16 of the 20 most frequent conditions. For adult dependents, the rates were higher in Moscow in 18 of the 20 most frequent diseases. For dependent children, rates were higher in Moscow in 13 of 21 diseases.

Further, female employees in highly exposed areas of the Moscow embassy had more subjective complaints in 16 out of 19 symptom categories than female employees in less exposed areas. Male employees had fewer complaints in 18 of 20 symptom categories in the highly exposed areas than in the less exposed areas. The authors did not know what to make of this inverse correlation, but the finding is not bizarre. The Eastern European literature in particular emphasizes that an initial symptomatic period is followed by several years of adaptation, after which decompensation and more serious, permanent injury occurs. It is also consistently reported that workers chronically exposed to very weak microwave radiation report symptoms with significantly greater frequency than those chronically

exposed to stronger radiation. The reason for the differing response of male and female employees in the Moscow embassy was not explored in the Lilienfeld study, and may well lie in a differing average length of exposure; however, the number of years at the embassy post for men and women is not given in the study. I beg to refer to a copy of the tables cited, upon which, marked with the letters "AFS 16", I have signed my name prior to the swearing hereof.

(c) The Robinette (1980) study is a faulty study because (1) no accurate assessment of individual exposure levels was undertaken, and (2) the control group, consisting of radio operators, radar operators, and aviation electrician's mates, is also an exposed group. I beg to refer to a copy of the Robinette study, upon which, marked with the letters "AFS 17", I have signed my name prior to the swearing hereof.

T. Drs. Bailey and Erdreich pay heavy attention to the issue of cancer (paragraphs 16, 17a, 17b, 18 and 19 of their Report). I pay little attention to cancer in my book, because, as I point out, the evidence for microwaves causing cancer is sparse (Microwaving Our Planet, page 16), and also because cancer is not the predominant problem in exposure to low-intensity microwaves. The predominant problem, for which there is enormously more evidence than for cancer, is that pulsed high-frequency microwaves are causing serious neurological and cardiac disease in masses of people.

U. In paragraph 20 of their Report, Drs. Bailey and Erdreich address an important issue: that of dose-response. However they have failed to review the relevant literature, or if they did, dogmatic principles have prevented their evaluating it properly. It is in fact not always the case in toxicology that a higher dose means a greater biological response, and it is certainly not always the case that there is always a no-observed-adverse-effect-level. Indeed ionizing radiation does not follow either of these rules. Nonionizing

radiation has been shown to also produce a similar biphasic response in organisms (Oscar and Hawkins 1977, Balcer-Kubiczek 1994, and Bawin et al. 1970, cited on p. 40 of Microwaving Our Planet, Exhibit "A").

V. In paragraph 21 of their Report Drs. Bailey and Erdreich challenge my statement that there is no threshold for microwave effects on the nervous system and the heart and claim, wrongly, that I did not provide substantiation. See Kondra et al. (1970, 1972), showing effects on reproduction of chickens at 0.00000002 microwatts per square centimeter; Selga and Selga (1996), showing premature aging and effects on seed germination in pine trees at 0.000024 microwatts per square centimeter; Marha (1969) reporting effects on cell division in plants at 0.0000000026 microwatts per square centimeter (cited on pp. 18, 21, and 22 of Microwaving Our Planet). These experiments, unfortunately, probably cannot be replicated anywhere on the earth today because of microwave pollution from the recent worldwide expansion in telecommunications.

W. In paragraph 22 Drs. Bailey and Erdreich refer to the Tofani (1986) study I cite as a "single aberrant study" showing effects on reproduction. They ignore Ouellet-Hellstrom and Stewart (1993), Huai (1979), Kolodynski and Kolodynska (1996), Navakatikian and Tomashevskaya (1994), Krueger and Giarola (1975), Bigu del Blanco (1973), Kondra et al. (1970, 1972), Il'chevich and Gorodetskaya/McRee (1980), and Gordon (1974), all of whom I also cite. The only study cited by Drs. Bailey and Erdreich is one by Lary and Conover (1982). This study is at grossly thermal levels of 24 milliwatts per square centimeter which heated up the experimental animals to a temperature of 43°C, and which therefore has no bearing here. The claim of Drs. Bailey and Erdreich that "Reviewers who have conducted comprehensive reviews of the research literature have concluded that only exposures associated with heating

are linked to reproductive risks" is not correct. See, for example, the NCRP (1986) criticism that differentiating thermal from athermal effects is problematic because "many of the authors who reported defects have employed acute, highly intense irradiation that obviously has placed a thermal burden on the irradiated subject" (Biological Effects and Exposure Criteria for Radio-frequency Electromagnetic Fields, National Council on Radiation Protection and Measurements, Report #86, April 1986, p. 65, cited in Microwaving Our Planet).

X. A new, important study on reproductive effects has been reported by Magras and Xenos (1997) in the journal Bioelectromagnetics. This study consisted of radiofrequency level measurements and in vivo experiments at several places around an antenna park in Greece. Twelve pairs of mice, divided in two groups, were placed in locations of different power densities and were repeatedly mated five times. One hundred eighteen newborns were collected. A progressive decrease in the number of newborns per dam was observed, which ended in total and irreversible infertility by the fifth generation, at both experimental locations, whereas under identical conditions at a location 10 kilometers away from the antenna farm, normal fertility was maintained throughout all five generations. The experimental locations were: a wildlife refuge near the antenna park, where the measured power density was 168 nanowatts per square centimeter; and the third floor of a public primary school 1.5 kilometers away, where the measured power density was 1.053 microwatts per square centimeter, and where total irreversible infertility occurred by the third generation. I beg to refer to a copy of this study of Magras and Xenos, upon which, marked with the letters "AFS 18", I have signed my name prior to the swearing hereof.

Y. In Skrunda, Latvia, where a radar station has been operational since 1971, epidemiological studies begun in 1989 have shown effects on organisms wherever they have bothered to look: impaired motor function, reaction time, memory and attention among schoolchildren; chromosome damage in cows; abnormal growth, shortened life span and impaired reproduction in duckweed plants; decreased thickness of growth rings in pine trees; premature aging of pine needles and cones; decreased pulmonary function in children; increased white blood cells, especially in children. Exposure levels did not exceed 10 microwatts per square centimeter anywhere, usually did not exceed 1 microwatt per square centimeter, and effects were demonstrable (relative to unexposed control populations) even where the exposure levels were less than a nanowatt per square centimeter. I beg to refer to copies of the Skrunda studies which have been published in the Science of the Total Environment, January 1996, upon which, marked with the letters "AFS 19", I have signed my name prior to the swearing hereof.

15. My recommendations, based on the weight of the scientific literature; based on the important recent studies in Berne, Switzerland and in Skrunda, Latvia; based on the adverse effects on masses of people around the world from the new digital technologies; based on average population exposures which are reported in the literature previous to the new buildout of digital technologies; and based on my personal and professional experience, are as follows:

(a) The limit on exposure of the general public to radiofrequency and microwave radiation should be set no higher than 0.001 microwatts per square centimeter;

(b) Pulsed (digital) signals should never be broadcast;

(c) Radiofrequency and microwave transmitting antennas should not be located in wilderness or other environmentally sensitive areas;

(d) Radiofrequency and microwave transmitting antennas should not be located within one mile of homes or populated areas.

Before the
AUSTRALIAN COMMUNICATIONS AUTHORITY

Exhibit 4
Cellular Phone Taskforce
Dec. 21, 1997

In the Matter of

Radiofrequency Electromagnetic
Energy: Proposal for Mandatory
Human Exposure Standards and
Compliance Framework

To: The Manager

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COMMENTS OF THE CELLULAR PHONE TASKFORCE

The Australian Communications Authority proposes to establish mandatory human exposure standards, for frequencies of 10 MHz to 300 GHz, of 200 microwatts per square centimeter non-occupational and 1 milliwatt per square centimeter occupational. The Cellular Phone Taskforce is an international clearinghouse for reports and information about illness and injury which are being caused by radiofrequency radiation from cellular phone base stations and wireless facilities of all kinds. Its president, Arthur Firstenberg, is a medically trained author, researcher, and consultant in the area of health and electromagnetic injury, and a recognized expert on the subject of radiowave sickness, also known as electrical sensitivity. The Cellular Phone Taskforce hereby submits its comments.

We refer to the book, Microwaving Our Planet: The Environmental Impact of the Wireless Revolution (Arthur Firstenberg, Cellular Phone Taskforce, 1996, 1997). This is a comprehensive review of the scientific and medical literature on the health effects of radiofrequency radiation

at exposure levels of 500 microwatts per square centimeter and less. There have been no other reviews published in the world of the literature on non-thermal exposure levels only. This literature goes back to 1926 in the Soviet Union and 1927 in the Western literature. Consistent throughout seven decades and thousands of epidemiological, clinical, and laboratory studies on humans and animals is a particular type of damage to the heart and the nervous system of all organisms of radiofrequency radiation at exposure levels of 0.001 microwatts per square centimeter and more. Indeed, biological effects on organisms, particularly reproductive and growth effects, have been found at exposure levels all the way down to 0.000024 microwatts per square centimeter (Selga, T. and Selga, M., "Response of *Pinus sylvestris* L. needles to electromagnetic fields", The Science of the Total Environment 180:65-73, 1996), 0.00000002 microwatts per square centimeter (Kondra, P.A. et al., "Growth and reproduction of chickens subjected to microwave radiation", Canadian Journal of Animal Science 50:639-644, 1970) and 0.0000000026 microwatts per square centimeter (Marha, K. in Symposium Proceedings: Biological Effects and Health Implications of Microwave Radiation, Richmond, Va., 1969, S. Cleary, ed.).

Allan Frey, Ph.D. biologist, discovered the now well known and accepted microwave hearing effect in the early 1960s. This occurs at peak exposure levels and average exposure levels of pulsed radiation well below the proposed

Australian limits (200 microwatts per square centimeter average power density and 1940 volts per meter maximum electric field strength for each pulse), and can be sheer torture for those people most sensitive to such auditory effects. Dr. Frey also discovered, in meticulous experiments on frog hearts, and also on live frogs, that 0.6 microwatts per square centimeter can be enough to cause arrhythmias or even stop the heart if the heart is exposed to a microwave pulse at a particular time during its rhythm. (Frey, A.H. and Seifert, E., "Pulse modulate UHF energy illumination of the heart associated with change in heart rate," Life Sciences 7(Part II):505-512, 1968.

In Switzerland a study by Theodor Abelin, M.D., proved that complaints of radiowave sickness--insomnia, weakness, nervousness, joint and limb pain, memory loss, heart palpitations, cough and sputum, shortness of breath, headache, dizziness, etc.--are directly associated with the electromagnetic field strength of a shortwave transmitter at Schwarzenburg, Berne, Switzerland. This also affects nearby residents' blood pressure, it affects melatonin levels in cow saliva, and there is a statistical correlation with fewer children promoted from primary to secondary school nearer to the transmitter. Health effects were found even where the average exposure level was only 0.002 microwatts per square centimeter. See Abelin, T. et al., "Study on Health Effects of the Shortwave Transmitter Station of Schwarzenburg, Bern, Switzerland, Study No. 55, August 1995, Swiss Federal Office of Energy, and followup studies by Stärk et al. in Journal of Pineal Research 22:171-176, 1997; and Altpeter et al, to be published

shortly. As a result of this study, the Working Group on Non-Ionizing Radiation for the Federal Office of Environment, Forests, and Landscape--the very group which had previously recommended adopting the ICNIRP limits in Switzerland--changed its opinion and now regards these limits as not protective against chronic exposure (report of March 1996).

In Skrunda, Latvia, where a radar station has been operational since 1971, epidemiological studies begun in 1989 have shown effects on organisms wherever they have bothered to look: impaired motor function, reaction time, memory and attention among schoolchildren; chromosome damage in cows; abnormal growth, shortened life span and impaired reproduction in duckweed plants; decreased thickness of growth rings in pine trees; premature aging of pine needles and cones; decreased pulmonary function in children; increase white blood cells, especially in children. Exposure levels did not exceed 10 microwatts per square centimeter anywhere, usually did not exceed 1 microwatt per square centimeter, and effects were demonstrable (relative to unexposed control populations) even where the exposure levels were less than a nanowatt per square centimeter.

The mistake made by those who set standards for us all is to insist on reviewing all of the literature on the effects of exposure to any level of radiofrequency/microwave exposure. This has the wrong result that the vast majority of experiments have been done at levels of 1 milliwatt per square centimeter and more, often considerably more, where

either it is impossible to distinguish thermal from non-thermal effects, or else the thermal effects mask the non-thermal effects completely. It is not true in the case of even ionizing radiation that (1) there is always a threshold level, below which no adverse effects are observed, and that (2) there is always a dose-response relationship, i.e. a high dose will not necessarily produce the same effects as a low dose. Nor is it the case, as 7 decades of research has borne out, in the case of non-ionizing, and in particular radio-frequency radiation. There is a syndrome, documented in epidemiological studies and clinical examinations over several decades of thorough research and thousands of publications involving large numbers of exposed workers in the Soviet Union, and continuing to this day in modern Russia, known as radio-wave sickness. It occurs more often at levels of exposure around 1 microwatt per square centimeter than it does at higher exposures: higher exposures are more often associated with cataracts, cancer, and frank thermal injury.

There is also a syndrome now known in the United States, Australia, Sweden, Germany, England, and in fact most modern countries, known as electrical sensitivity. This is also the result of injury by (usually low levels of) electromagnetic radiation, resulting in subsequent vulnerability to, and lifelong disability from, exposure to electromagnetic radiation, very commonly radiofrequency radiation from cellular phone base stations.

The Cellular Phone Taskforce receives reports of such illness and injury regularly--we field approximately 30 to 40

such phone calls per week, and an equal amount of mail. To date we have heard from over 1,000 individuals, doctors, nurses, and organizations in the United States, and a smaller number worldwide, reporting this syndrome either in their patients, their members, or themselves. The most common symptoms include insomnia, dizziness, headache, nausea, dehydration, pressure behind the eyes, swollen thyroid, sudden increase in blood pressure, sudden change in pulse rate, loss of memory, loss of appetite, trembling, muscle spasms, coughing, wheezing, pressure or pain in the chest, pain in the legs or the soles of the feet, testicular or pelvic pain, and sometimes fever, rash, or nosebleeds. Some people report they feel like they are being electrocuted. There have been some deaths, subsequent to this syndrome, from brain hemorrhage or heart attack. An unknown number of people have been forced to flee their homes and their cities following the activation of massive numbers of antennas on apartment buildings and lampposts for personal communications services (PCS) digital networks at about 2 GHz. We understand that PCS has not yet come to Australia, but it is definitely well within the exposure limits proposed by the Australian Communications Authority. The president of the Cellular Phone Taskforce, Arthur Firstenberg, is himself an environmental refugee, having personally been forced from New York City to save his life because he is electrically sensitive and suffered near-total paralysis, including respiratory paralysis, upon the activation of a PCS network in New York on November 15, 1996.

There is a very wide range of susceptibility to electromagnetic radiation, and in particular to radiofrequency radiation, among the general population. This is not surprising, since a wide range of susceptibility is the norm in virtually all medical conditions: it is rare for the entire population to succumb at once, whether it be to a virus or a bacteria or a carcinogen or a toxin. Studies done by Leitgeb (1994); Rea (1991); Sadchikova (1960, 1974); Limkova-Deutschova (1974); Knave (1992); Firstenberg (1996); Szuba and Szmigielski (1994); and Hanson (1995) have come up with estimates from 2% to 15% of the population as being electrically sensitive, i.e. these people will be ill upon exposure to levels that do not seem to affect the majority.

However, even the 2% - 15% numbers are deceiving, and should not reassure the rest. With the advent of hundreds of thousands of PCS antennas sprouting throughout the United States at this moment, it has now become possible through informal surveys, to establish that bronchitis and sinusitis are becoming epidemic as a chronic phenomenon near these antennas, and that people who notice nothing else will nevertheless begin not to sleep quite as well, and their eyes will often begin to bother them, or their vision to deteriorate. As the proliferation of antennas, digital, at 2 GHz range, has occurred universally and suddenly beginning about one year ago, and official vital statistics are normally a year or more out of date, the overall effects on morbidity, mortality, and life expectancy in the United States and elsewhere are not

yet known. However, the implications of what is being reported to the Cellular Phone Taskforce are ominous.

The extent of the problem may be gauged by the following: There have already been 3 international scientific conferences and 1 international medical conference devoted entirely to electrical sensitivity: the 1st and 2nd Copenhagen Conferences on Electromagnetic Hypersensitivity, 1994 and 1995, proceedings available from the Danish Association for the Electromagnetically Hypersensitive, c/o Aase Thomassen, Lunden 1, Alum, DK-8900 Randers, Denmark; the Cost 244 Workshop on Electromagnetic Hypersensitivity, 1994, available from Dr. Dina Simunic, COST-244 External Secretariat, Technical University School, Dept. of Electrical Engineering and Computing, UNSKA Street 3, HR-10000 Zagreb, Croatia; and the International Symposium on Bioelectricity, Dallas, Texas, 1997, available on audiotape from the American Environmental Health Foundation, 8345 Walnut Hill Lane, Suite 225, Dallas, Texas 75231, U.S.A. Here in the U.S. we also have a support group, the Electrical Sensitivity Network, P.O. Box 4146, Prescott, Arizona 86302, which also has international membership. We also have the Jeremiah Project, 222 Soft Wind, Canyon Lake, Texas 78133, created by the Presbyterian Church to minister to the electrically and chemically sensitive of the United States.

At its Annual Conference in October 1997, the New South Wales Local Government Association passed a Motion supporting an emissions limit of 0.001 microwatts per square centimeter; a setback of mobile telephone base stations of at least 500 metres from residences, schools, child care centers, hospitals

and nursing homes; and the reversal of the federal policy of exclusive digitalisation for Australia by the year 2000.

The Cellular Phone Taskforce agrees in large part with the recommendations of the Local Government Association of New South Wales. Based on careful review of all of the scientific literature on non-thermal injury; based on continued incoming reports to the Cellular Phone Taskforce from all over the world; based on the personal experience of being injured which many of our members share; based on our knowledge of exposure levels to the population which are causing injury already at the present time all over the world, especially in metropolitan areas where the buildout of PCS networks has already occurred; and based on widespread reports of environmental harm, in particular the abandonment of the neighborhood by insects and wildlife upon the erection of cellular phone base stations, the Cellular Phone Taskforce therefore recommends to the Australian Communications Authority the following:

(1) maximum permitted exposure of the general population to radiofrequency radiation from 10 MHz to 300 GHz, cumulative from all emitting sources, should be 0.001 microwatts per square centimeter;

(2) the policy of digitalisation should be reversed: broadcast of pulsed signals should never be permitted, from earth-based antennas or from satellites;

(3) 1.5 kilometres is an appropriate setback requirement from residences, schools, child care centers, hospitals, and nursing homes;

(4) radiofrequency or microwave broadcast facilities should be permanently excluded from wilderness areas, parks, wildlife preserves, and other environmentally sensitive areas.

Respectfully submitted,



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December 16, 1997

No Place To Hide

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The Informationization of the Third World

by Arthur Firstenberg

Ann Engelstadt sent me a clipping from the Dec. 1 Los Angeles Times featuring a picture of a Bangladeshi village woman in a green sari holding a cellular phone. "For the first 40 years of her life," the article begins, "Nurjahan never had a chance to reach out and touch someone. Indeed, the sari-draped goatherd and grocer confessed recently that she had never even seen a telephone.

"That's not unusual in Bangladesh. Until last summer, the poverty-racked country of 120 million—nearly half the U.S. population squeezed into an area the size of Wisconsin—had only about 400,000 phones, or one for every 300 people.

"Then, overnight, Nurjahan—who, like many Bangladeshi women, has no last name—literally became the telephone system in her little village. With a single cellular phone, she connected 8,000 peasant farmers and their families with the outside world, transforming a centuries-old lifestyle. For a small fee, villagers may use the cell phone at her food stall in the town market; for slightly more, she will bring the phone to them and let them use it in their mud-brick huts.

"The scheme—to create a rural communications network by equipping one woman in each village with a cell phone—is the most imaginative of several new efforts to address one of the world's most basic technology gaps. As President Clinton told the U.N. General Assembly in September, 'More than half the world's people are a two days' walk from a telephone.'

"The issue is not just inconvenience. Too many people are 'literally disconnected from the global economy,' Clinton warned, and their lack of access is producing 'growing disparities between haves and have-nots.'"

The transformation of this world by wireless technology is unimaginably profound, and its consequences go far beyond the spread of microwave radiation. "We're moving into a distanceless world," said Mohammed Yunus, founder of Bangladesh's innovative Grameen Bank, which is sponsoring the spread of cell phones to villages and plans to hook up 40,000 of the country's 68,000 villages over the next four years."

Much has been written in recent years about the globalization of culture, and whether or not that is a desirable

thing. For example, the introduction of a cell phone in each Bangladeshi village can be expected, ultimately, to end the cohesiveness of village life which can only come from relative isolation from the outside world. And if this is happening everywhere in the world, without exception, then the traditional village will cease to exist anywhere on this earth within the next decade or so.

But an even more important question is what will happen to nature? Can nature survive at all in a distanceless world? I think the answer, if ecologists and environmentalists brought their knowledge to bear, would be a resounding no. Biodiversity depends on distance. What is not often acknowledged is that cultural diversity also depends on distance, and that culture is nature-based. Local dialects, and local handicrafts, and local dress, and local economies, and local varieties of crops, and local varieties of plants and animals—i.e. local ecosystems—depend on the village's being a two days' walk from a telephone. The most basic reason for the disappearance of species is that very few of them can withstand the global exploitation that must come when there is instantaneous transportation and communication.

"Globally, areas known in telecommunications lingo as 'teledeserts' are beginning to blossom," the Los Angeles Times article continues. "Bedouin nomads in the Middle East negotiate deals for their sheep and goats on cell phones. Australian aborigines use satellite videoconferencing to sell their artwork. In the West African countries of

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Ivory Coast and Ghana, shared cell phones are enabling rural coffee and cocoa farmers to call produce markets in the cities and negotiate their own prices...

"In South Africa, 'calling cabins'—banks of cell phones set up in portable shipping containers—are connecting long-neglected black enclaves to the cities...Indonesia now has thousands of neighborhood service outlets (called wartels) offering cell phones as their chief attraction, often with copiers, fax machines and soft drink machines as well. Comparable facilities have emerged in Tunisia...Many of the 30 million Chinese with pagers have developed an independent communication network...In Africa, where several countries still have less than one conventional phone per 1,000 people, some two dozen countries have introduced cellular systems."

Iqbal Quadir, involved in the Bangladesh program, is quoted as saying, "In only a few years, virtually everyone in Bangladesh will have access to a phone...If that can be achieved in Bangladesh, one of the poorest countries, then the rest of the world should be able to gain access to basic information technology within a decade."

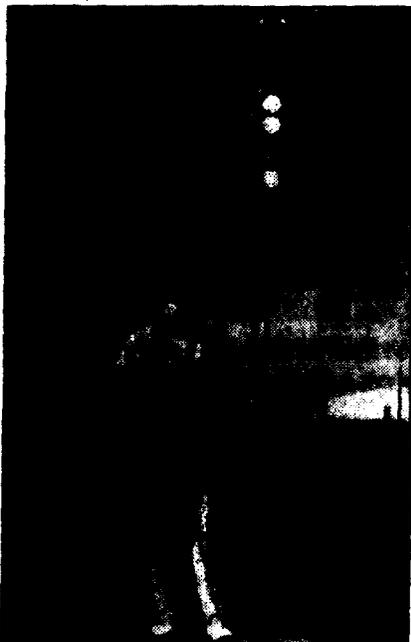
This issue of *No Place To Hide* reports on efforts in legislatures and in courts to come to grips with at least the direct damage caused by microwave radiation from the information explosion now engulfing the world.

The Wagram Inn, Reynoldsburg, Ohio

"The Management of the Wagram Country Inn is not responsible for electromagnetic microwave radio frequency radiation from the cellular phone towers adjacent to this property."

The reason Alice and Jim Beougher have put this notice in their office and guest rooms can be seen by looking out their window at the 4 cellular towers that loom above their mid-west landscape. All are between 200 and 300 feet tall, none is more than 800 feet away, and the closest would just about fall on their country inn if the wind were strong enough.

The man, Richard Humphreys, who is leasing his 20



acres to Air Touch, Nextel, and apparently any other comers, used to serve on Etna Township's zoning commission, but resigned last year after he was convicted of a federal felony in connection with the illegal export of nearly \$500,000 worth of 2-way radios and electronic equipment to Iran over a 4-year period. Humphreys' land was rezoned for manufacturing use in the late 1980's, and he was quoted in the *Advocate*, a local newspaper, on July 2, 1997, as saying he isn't going to stop leasing tower space. "The land I have set aside for towers I could put 4 or 5 on", he said. "I could put 100 towers with as much land as I have out there, but I won't."

The Beoughers have lived in the shadow of one microwave relay tower, owned by MCI, for the past 13 years. The first cellular phone tower went up in April 1993, another in 1995, and a PCS tower was brought in on a crane on March 21, 1997.

These towers are devastating the health of Jim and Alice Beougher, both 65 years old, and many of their neighbors. "Last year in November I went to the doctor because I kept sleeping and sleeping, I didn't know what was wrong with me," Alice said. "And in the hospital they found out my thyroid had totally shut down. I also have a lump on the side of my neck that has nothing to with my thyroid. They have me on medication for my thyroid."

"When they put this PCS tower up in March, we were up night and day, we could not sleep, my husband and I and also my son, who was going to college. And we still have insomnia, we haven't gotten adjusted. My son had headaches. My husband also has little blisters on his cheeks. If he stays out away from the towers, then the blisters go away. and he has a lump on top of his head. We're outdoor people, but we're both failing so fast. Neither one of us drinks, we don't run around, and yet we feel tired, exhausted, we shouldn't feel the way we feel at 65. We eat good and we've always been very active. Yet we feel worn out. And I have nosebleeds."

"The lady across the street was out raking leaves feeling fine, two hours later she's in the hospital with pneumonia. The woman next door to her can't breathe and is on oxygen. The people on the other side of the towers, the whole family's been sick. The lady in Room 2 here in the Inn shakes all the time, just within the last year. There was a lady that lived down on Mink Road, and she said the towers were affecting her immune system, so she moved away about 7 months ago."

"Our garage doors kept going up and down by themselves for awhile. Say that we would have to have a pacemaker, we could never come home from the hospital. When they first installed the 260-foot tower in 1993, we lost computers, plus we had an intercom that stopped working, our TVs had interference, we were hearing voices over our phones. That was because they put in that tower without a

ground wire. An inspector came, and they have that grounded now. But there are no inspectors any more.

"This affects the animals too. My son had a pet iguana that got a great big growth on the side of its face, it was huge, so he had it put to sleep a little over a month ago, he'd had it for 4 years. And there are no birds or deer or any wildlife here any more, everything's left. We used to have a lot of wild geese, they're gone. We also noticed that all the robins that we used to have around here, their eggs never hatched, and now we know why, after reading Kathy Hawk's study. Now they all left, we don't even have any

more robins since they put that last tower up. We don't have any bees either.

"This has also brought down our property value at least \$150,000. We own one of the most beautiful pieces of property on National Road.

"I can't believe my brother fought in a war for our freedom, and our government put up these towers to kill us. Our 'environmental' President has loosed one of the worst health disasters on us, worse than lead, worse than asbestos. They tell us there are no health effects, but I *know* there are, from living underneath them."

Report from Sweden

"Cellular phones force people to flee their homes", says a press release of November 11 from HSO, a Swedish organization for the disabled. The press release continues:

"Many of the people who are electrosensitive become sick from cellular telephones and other wireless communications. In the Stockholm area FEB, the Swedish Association for the Electrosensitive, has 500 members. Of those electrosensitive people are many whose health is now at risk because of the buildout of cellular phone networks which is going on.

"FEB in Western Greater Stockholm, in writings and in meetings with decision-makers in affected communities, has tried to put a stop to this buildout.

"President Inger Svedmyr writes:

"What we want to bring about are electromagnetic free zones, for example in the whole green district from Riddersvik to Gåseborg with neighboring parts of Hässelby and Viksjö.

"If we don't succeed, 9 families with 11 electrosensitive persons risk being forced to move from their homes. From Hässelby 3 people have already fled and 2 more are doing poorly.

"HSO, the Swedish Cooperative Body of Organizations of Disabled People for the Stockholm area (which includes 28 different groups of handicap organizations) gives its support to the members of FEB.

"It is unacceptable that several families have been forced to flee their homes due to the sending and receiving antennas which have been built in their neighborhoods. We demand that their ideas about **electromagnetic free zones** for the electrically sensitive be listened too and that the development of cellular phones be carried out in a controlled manner.

"This is a question of public health which can grow into enormous dimensions if not properly handled today."

According to Leif Södergren, the international contact for FEB, 25% of the population of Sweden have cellular

phones, compared to about 5% for France and Italy. In addition to digital (GSM) cellular phones, Sweden already has digital television and digital radio service. Sweden does not yet have PCS technology which broadcasts at close to 2 GHz and has already come to rooftops and lampposts in cities throughout the United States, and which has caused people to flee their homes here. PCS is expected to make its Swedish debut in January 1998. In addition, says Leif, the industry has found ways to send cable TV through telephone lines, and to send up to 20 GHz broadcasts through ordinary powerlines. The search for new ways to send communication signals is relentless.

Interview with Per Segerbäck

Per Segerbäck has been living in an iron-clad room since 1990.

The number of electrically sensitive is growing everyday. Basically, every week for the last few months we hear about people who have become so much worse in their condition that they have to move away from Stockholm. We have several friends that had to flee from the city, they have moved out into the archipelago, or in parts of Sweden where there are very few towers around.

We are trying to get the local politicians to understand that they have to do something about this, and we have been successful in a few cases, actually stopped towers from being raised here in the Stockholm area. But actually there are just too many of them already for us, so what we have to do is get them to turn the ones that are already up, to get them to turn them off. We'll have to go as high up in the government to get them to do that as we need to. On the local level we actually have been able to persuade the local politicians working with the environmental questions to write formal letters to the Social Services department of the government.

Right now I'm feeling quite bad. I live in a faraday cage,

it's shielded with a couple of layers of metal. I'm an electronics engineer, I work for Ericsson. They built this room for me, basically to shield me off from my neighbors, so I could live in this house and work from here. It was okay before we had this huge expansion of the mobile phone network. Up until a couple of months ago I was able to go to my office 20 kilometers away from here at least twice a week to talk to my colleagues and to attend meetings and things like that, but since about 3 months ago I can't really go outdoors at all anymore. And this room wasn't really built to be microwave-proof, it's fairly good from DC up to maybe 100 MHz or so, but above that it's full of holes. It's very expensive and difficult to shield against the higher frequencies. Actually I think it's almost even worse to be inside this shielded room than outside when airplanes are passing over. The microwaves from the radar equipment in airplanes actually bounces around this room.

Both my wife and I are engineers, and we both hear the microwaves, we hear the same thing at the same time. And we've been talking to a lot of the hypersensitive people here in Sweden, and it seems like everybody has basically the same kind of phenomenon, of hearing the same thing at the same time. The strange thing is not that we actually hear the microwaves—because that's something that is scientifically proved, that people with normal hearing can actually hear microwaves.

It's very important for people all over the world to keep in touch. I think we all have the same problem: the local gurus, so to speak, the scientists, and the local governments, and so on, they tend to try to get us to believe that we are the only ones who have this problem, and that it is all psychological.

Massachusetts

Susan Clarke was interviewed for this newsletter on December 7

Town of Lincoln Requires Board of Health To Take Up Cell Tower Issue

This past Wednesday evening the Planning Board of the Town of Lincoln had to move its meeting from out of the town Hall to a large auditorium because of the huge crowd gathered in this small town, to talk about tower placement by Sprint. The crowd unanimously laughed at several of Sprint's presenters who clearly were taking them for a ride, and were so united in their opposition to Sprint that the Planning Board acting chair, Mr. Cooper, called to continue the meeting so that much more information could come out. Mr. Cooper also immediately after the meeting assigned that the Board of Health take up this issue and look at the science on the health data. The Planning Board will meet again on this issue December 15.

Many residents got up and made excellent comments including on the health issues, despite the fact that the Lincoln Town Council had instructed Mr. Cooper not to allow health issues to come up at this meeting. He didn't disallow the *people* of Lincoln from speaking; however, when the Sprint attorneys said "we'd like to respond to these issues," Mr. Cooper said well, we really aren't allowed to speak about health, Town Council said so. The Sprint representative said, "Well, you just heard an entire presentation on health". In fact one man had said perhaps a paragraph about health, based on information he had read which I placed in the Concord library for anybody to see.

And so Mr. Cooper opened it up to the crowd and said, "What is the consensus of the people?" and all the people said "No!", which was wonderful because they were saying "No!" to Sprint.

Next Sprint brought in this supposed expert on real estate value who told them, "We have very little data at this point, but based on our data, there would be very little real estate devaluation in your area," which caused everybody to laugh out loud. Someone got up from the crowd and said, "Surely, then, Sprint would be willing to insure us against that very small loss of real estate value." And of course the Sprint guy said "No, Sprint is not in a position to do that."

So the Planning Board chair said, "Maybe we could revalue all the property that has a tower in its sight and lower the taxes for you folks." And then this wonderful guy whose name is Hepgood Wright, an older man who's very astute and very funny, in a tongue-in-cheek sort of way, started his presentation by saying, "And my second concern

is money." He said, "Now the way I figured it, if we cut taxes on all the people who have a tower in their sight, the town will stand to lose at least \$250,000 per year in tax revenue, so what we need to do obviously is raise taxes on everybody who doesn't have a tower in their sight." Everybody was laughing.

There were several attorneys, and others too, who stood up and questioned the constitutionality of what was happening there. And then I got up to speak, and I held up my slide of that particularly offensive clause of the Telecommunications Act, "No state or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects..." I said that the industry had been spreading the rumor that environmental effects in the language of this clause included health effects, when obviously that was not the case. And I said, "Moreover, this has caused Town Councils similar to yours all over the country to tell the local people going to their local Board meetings that they were not permitted to speak about health. I said obviously this is a blatant violation of your First Amendment rights.

I said, "But the good news is there are two bills currently before Congress, one introduced by Leahy and the other by Sanders, which you may wish to support because they are purposed to repeal some of the preemptions of the Telecommunications Act, and perhaps if you folks should decide to declare a moratorium like Concord has, you may well see your rights come back to you," and they applauded strongly.

One woman said, "If what Sprint is most concerned about is the so-called drive-by rule, that is the people who drive through Lincoln can use their digital phones while driving, then I think we should declare a blank spot in Lincoln. We don't want them driving dangerously on our roads while using their phones."

The very last speaker said, "We have heard again and again in this meeting about the detriment of this technology to our community and to our Town. I have yet to hear any quantification of any benefit to our Town. So until we hear quantification of benefit, I think we should not even consider this."

The "H" Word

At a Planning Board meeting in Concord last Tuesday, Dec. 1, the moderator, Gary Clayton, announced that there would be no discussion of health in this meeting. So Virginia Heinz, who has really taken this issue up, said, "Well, if we're not allowed to use the 'h' word, maybe we should just think of it this way: here's a technology whose safety has not yet been proven. Do we want to have this at all?" And then from that point on in the meeting everyone

was laughingly using that expression, "the 'h' word". To the point where finally Gary Clayton said, "Well, I guess really we ought to be able to talk about the 'h' word." So people are starting to get it.

Worcester

In Worcester, an amendment to its Zoning Ordinance, to be discussed Dec. 10 before the Planning Board, says it is the "express purpose" of this Ordinance to, among other things, "minimize potential adverse effects on human and animal health."

Who will be the first community in this country with the backbone to permit *no* adverse effects on human and animal health?

Ireland United Against "March of the Masts"

by Cal McCrystal

Reprinted from *The London Observer*, 16 Nov. 1997

An extraordinary grass-roots rebellion is sweeping both parts of Ireland, sending people into the hills at night and causing road-blocks, ambushes and a great fearfulness among ordinary people for their children's safety. It has nothing to do with the Troubles, or ceasefires, or "talks processes" and it unites old enemies north and south of the border.

The rebellion is against the "march of the masts"—towers of steel planted throughout the Irish countryside to transmit mobile phone signals. The rebels, whose tactics include legal action as well as more physical confrontations, claim that microwaves emitted by the masts may cause cancer, and their magnetic fields create long-term nervous disorders.

In what appears to be an attempt to circumvent community anger, the companies involved have tried erecting some masts in the dead of night. They decline to say how many installations are planned, or to sign statements accepting responsibility in the event of the masts being associated with future illnesses. They dismiss health fears from Australia and New Zealand, where authorities have ordered similar masts close to schools to be dismantled; and from the United States, where protests have kept 80 per cent of proposed masts on the drawing-board.

Claiming the microwave transmission to be harmless, the companies—the giant international operator Orange Communications in the north and Esat Digifone and Eircell in the south—are offering large sums to owners of property

on which they wish to build. In Northern Ireland, one farmer is reported to have received £75,000 for a tiny plot. Meanwhile the mobile phone vendors are intent on establishing a comprehensive consumer base. In Dublin mobile phones have been given away to customers who bought two bottles of wine in a supermarket. In Newry recently, they were distributed free to passers-by.

Opposition to the masts is gathering momentum. Citizens have agitated in Donegal and Derry, in Down and Louth, in Tyrone and Cavan, in Fermanagh and Galway, in Wicklow, Laois, Meath, Waterford and Dublin. "The remarkable thing is that, for once, the people of this island have found a common enemy," said one campaigner.

Nowhere is the conflict more visible than on a hilltop in County Cavan in the Republic of Ireland. Last week John Doyle, a retired baker, took me up the winding slopes of a mountain near Kingscourt, where three of the 12 masts in the area loomed through mist. He pointed to a tower enclosed by a barbed-steel fencing. "We formed the Cavan-Monaghan Anti-Mast Action Group and sent 40 or 50 people up here in September to stop this one going up in a place of great natural beauty," he said.

"When the contractor arrived up here in the dead of night, we blocked the road with vehicles. There's something cynical and wrong that semi-state companies should go ahead with these masts without telling people in advance."

A compromise allows the latest mast to stay for 18 months, after which, if health problems ensue, it will be dismantled. "I think that was a mistake," Mr. Doyle said, as workmen prepared to raise a transmission dish on the new structure. "It could take 10 years before symptoms appear. Meanwhile you're being cooked without knowing it."

Last Thursday night, 30 locals at Ballyculter, a few miles to the north of the Mourne Mountains, met to discuss the Castlemahon mast and hear reports of suspected health hazards. They voted to hold a public meeting in nearby Strangford.

Across Strangford Lough the people of Killyleagh will

hold their own public meeting this week. William Walker, a leading rebel, said: "We have asked Orange to have a representative there to answer our questions. We believe microwave radiation can give you cancer. We won't hound him but he won't be able to run away."

"We'll have Downpatrick's environmental health officer there, as well as someone from Friends of the Earth. And we'll want him to know that if Orange can build masts in dead of night, we can pull them down in dead of night."

John Taylor, the local MP and deputy leader of the Unionist Party, has said that if he cannot attend, he will send a letter of support. In south Down, the SDLP MP, Eddie McGraddy, has backed an anti-mast protest.

Recent meetings have been held in Dungannon, Omagh and Newtownards. Last Tuesday a meeting of Coleraine council almost reached incandescence when an Orange Communications representative, Garth Johnston, was confronted by Walter Graham, an anti-mast rebel, over plans to erect three masts in the area.

"I presented him with a personal statement saying that if microwave radiation does turn out to do harm, he would take responsibility." Mr. Graham said. "He said he couldn't sign it because he was only a surveyor."

Orange is one of several United Kingdom network operators. Its network covers about 92 per cent of the country and it is confident there will be 12 million mobile phone users by the end of the century. But its ambitions depend on having a network capable of supporting such services, which is why it has stepped up its base-station building programme.

There is also concern in mainland Britain. In Scotland, where £6,000 annual rent has been offered to landowners, Aberdeen has had a vigorous debate over suspected health risks in a transmitter on top of Oldmachar Academy. Professor Julian Little, an epidemiologist who used to study brain tumours for International Cancer Research, said he could not send his children to a school with such a mast on its roof.