

MICRO WAVE NEWS

Vol. XXIII No. 2

A Report on Non-Ionizing Radiation

March/April 2003

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WHO Invokes Precautionary Principle For High and Low-Frequency EMFs

What's Next Is Far From Clear

The World Health Organization (WHO) has decided that there is "sufficient evidence" to apply the precautionary principle to both power-frequency and high-frequency electromagnetic fields (EMFs).

In a draft position paper distributed at a workshop held in Luxembourg, February 24-26, Drs. Michael Repacholi and Leeka Kheifets, who run the WHO's International EMF Project, announced that they are now invoking the precautionary principle for extremely-low-frequency (ELF) EMFs and radio-frequency and microwave (RF/MW) radiation.

The precautionary principle calls for taking action to protect human and environmental health in the face of uncertain risks. While many, though not all, at the meeting agreed with WHO's decision, the big question that remains unresolved is what types of precautionary recommendations will emerge from the EMF project in Geneva.

"It could mean nothing or it could change the way people approach the EMF issue," Dr. Joel Tickner told *Microwave News* on returning from the workshop. "It all depends on the EMF group at WHO." Tickner, who has written extensively on the precautionary principle, teaches at the University of Massachusetts, Lowell.

Dr. Kenneth Foster of the University of Pennsylvania in Philadelphia, a former consultant to the WHO project who was invited to the Luxembourg meeting, contends that it is practically impossible to argue against the precau-

(continued on p.11)

U.S. NIEHS Advises: It's Okay for Children To Live Next to Power Lines

For the last six months, the National Institute of Environmental Health Sciences (NIEHS) has been telling families that children have nothing to fear from living next to power lines.

A statement posted on the institute's Web site advised:

It doesn't matter whether or not a house is close to power lines. There is no valid association between nearby power lines and any cancer—including childhood leukemia.

On April 1, a few days after *Microwave News* made inquiries about the statement, it was removed from the NIEHS Web site. "It's probably misleading,"

(continued on p.3)

EMF Program Is “Threatened” By Lack of Funds, EPRI Says

EPRI, the U.S. electric power industry’s research group, is warning its member utilities that its EMF health research program may soon come to an end due to a shortage of funds.

“The viability of the program...is threatened,” EPRI warned in a December 5 statement. This and other documents recently posted on its Web site offer a rare inside glimpse of the way EPRI markets its EMF program to utility managers.

EPRI points to “severe reductions” that have impaired its “ability to participate and contribute” in the work of scientific review panels. Industry support is needed, it states, to “ensure that EPRI continues to bring to the table its invaluable leadership, experience and expertise.” (See box below for EPRI’s reasons for wanting to continue EMF research.)

EPRI staffers took part in panels on EMF health risks convened by NIEHS’ RAPID program and by IARC (see *MWN*, J/A98 and J/A01). At this February’s WHO workshop on the precautionary principle (see p.1), there were four participants who have had long-standing ties to EPRI.

Dr. Robert Kavet, the manager of EPRI’s EMF program, declined to comment on the program’s budget, saying only that “EPRI takes EMF issues very seriously.”

The December 5 statement cites a number of issues that warrant attention, including the well-known association with childhood leukemia, as well as possible links to miscarriages and heart disease. EPRI also points to a risk assessment being planned by the WHO EMF project, the potential for public “outrage” and the possibility that exposure limits could be lowered, imposing “enormous costs” on the power industry (see below).

In January, EPRI posted another statement which leaves open the possibility that the link between EMFs and leukemia is due either to “inadvertent errors” in epidemiologic study design or

CNN’s “Medical Myths”

Myth: Electric blankets cause cancer.

Fact: That’s like saying using electric heat in your home will cause cancer, said Dr. Susan Nelson, internist with the Ochsner Clinic in Baton Rouge, LA. The evidence backs her up. For example, researchers at the Columbia School of Public Health studied more than 2,000 women newly diagnosed with breast cancer. “There was little or no risk associated with ever having used electric blankets, mattress pads or heated water beds,” the authors wrote. And they found no substantial difference with duration of use.

—“**Medical Myths: Electric Blankets a Hazard to Your Health?**” *CNN Health* (<www.cnn.com/health>), February 9, 2003; “**Nelson’s expertise is in the areas of internal medicine, geriatrics, long-term care (nursing home) [and] end-of-life care (hospice and palliative care),**” according to the Ochsner Clinic Web site, <www.ochsner.org>. She has also offered CNN opinions on other medical myths, including whether knuckle-cracking causes arthritis.

to contact currents. Much of EPRI’s recent EMF work has been targeted to the contact-current hypothesis championed by Kavet (see *MWN*, J/A00).

According to a series of questions and answers on EMFs posted last November on the EPRI Web site, <www.epri.com>, EPRI has spent approximately \$150 million on EMF research since it was established in 1973. The posting states that EPRI is now “the sole organization in the U.S. funding a research program to address uncertainties concerning the association of EMFs with childhood leukemia.”

EPRI: Seven Reasons Why EMF Research Must Continue

- **The childhood leukemia issue is unresolved.** NIEHS, IARC, the U.K.’s NRPB and the California department of health have all concluded that there is a possible risk.
- **Other diseases have been implicated but not adequately studied.** Miscarriages and heart disease have also been implicated: “Potential public health impact will be much higher than that for a rare disease like childhood leukemia.”
- **A critical assessment is under way.** “Severe reductions” in the EPRI program “substantially reduce our ability to participate and contribute.”
- **Outrage factors are involved.** “EMF taps into public fears about an unknown, unseen and undetectable agent that pervades every home and involves children.” It is also “perceived—how-

ever unfairly—as being imposed by corporate interests who evade responsibility for correcting the harm they cause.”

- **Costs could be enormous.** If the U.S. adopted the Swiss or Italian ELF limits of 2-10 mG, it “would impose enormous costs on power delivery.”

- **The scientific basis for existing guidelines is unclear.** “Further research would help clarify the scientific basis for guidelines and reduce the uncertainty that needs to be incorporated into safety factors.”

- **“Exceedance” of exposure limits near electric power facilities has been documented.** Electric field levels have been found to exceed exposure limits within rights-of-way of 115 kV and higher transmission lines.

Sources: *Why a Viable EPRI EMF Program Is Essential* (December 2002), and *EMF Exposure Guideline Research: An Electric Power Industry Priority* (December 2002).

Male Breast Cancer Lawsuit Going to Trial in New Mexico

A lawsuit filed by two men who blame EMF exposures at work for their breast cancer will go to trial on April 14. New Mexico Judge William Lang in Albuquerque rejected defense motions to dismiss the case on March 26.

Two years ago, James Montañño and Arthur Slater filed complaints against the City of Albuquerque and Bernalillo County, the joint owners of their office building (see *MWN*, M/J01). Their basement office was next to electrical distribution equipment.

Another man who worked there also developed a breast tumor, but is not a party to this suit. About 1,300 new cases of male breast cancer are reported each year in the U.S., according to the American Cancer Society.

The men are being represented by the Bregman law firm in Albuquerque. Amy Archibeque, one of the attorneys there, said that there may be as many as 30 more claims—involving other ailments—filed on behalf of others who worked in the office.

Plaintiff experts will include: Dr. Sam Milham, an epidemiologist based in Olympia, WA, Cindy Sage of Santa Barbara, CA, and Dr. Marc Wilkenfeld of Columbia University medical school in New York City. In a survey, Sage found magnetic fields above 100 mG in the men's office.

Robert Booms of Butt, Thornton & Baehr in Albuquerque is representing the county. He declined to comment. His experts include: Dr. Alvin Markovitz, a physician based in Los Angeles, Dr. John Moulder of the Medical College of Wisconsin, Milwaukee, and Michael Silva of EnerTech Consultants in Campbell, CA. Silva also surveyed the EMF levels in the office. The City of Albuquerque is being represented by its own lawyers.

NIEHS: Children Can Live Next to Power Lines (continued from p.1)



NIEHS News Features

September 2002

Do Power Lines Cause Childhood Leukemia?

NIEHS' New EMF Booklet Has the Answer

Ever since a 1979 study in Denver suggested that children living close to big power lines had a slightly higher risk of getting leukemia, the National Institute of Environmental Health Sciences and other environmental agencies have received thousands of inquiries about how far a house needs to be from a power line to be "safe" for the kids.

Electrical and magnetic fields, or EMF, are generated in the creation, transmission and use of electric power and electric devices. The earth itself produces EMF naturally. Scientists believe the earth's core produces electric currents.

A new NIEHS booklet currently being printed, "EMF Questions & Answers," says flatly that in terms of children's health, it doesn't matter whether or not a house is close to power lines. There is no valid association between nearby power lines and any cancer - including childhood leukemia, the booklet says.

Answers to questions in the booklet are based primarily on the EMF Research and Public Information Dissemination, or EMFRapid, program by NIEHS and the Institute's review of other available, peer-reviewed data worldwide. The Department of Energy administered EMFRapid, but NIEHS handled health effects research and risk assessments. The intensive NIEHS study included more than 100 cellular and animal studies and was completed in 1999 with a statement that the evidence of associations shown in some studies was "weak" and that the probability that EMF exposure "is truly a health hazard is currently small."

NIEHS Director Ken Olden reported to Congress that he saw no public health problem "warranting aggressive regulatory action" but said power companies and utilities should, as a precaution, continue siting power lines so that exposures are reduced.

The booklet incorporates information from later studies and reviews in Canada, Australia, several European countries and the World Health Organization and the National Academy of Sciences.

said Dr. Mary Wolfe, a senior scientist with the institute's environmental toxicology program. She explained that the statement had been written by a "non-technical person." (The full statement is reproduced at left; see also *MWN*, N/D02.)

The NIEHS statement prompted some harsh reactions. "The flat denial of any relationship between power lines and cancer is simply wrong. I had expected better from NIEHS," said Dr. Nancy Wertheimer in Boulder, CO. In 1979, Wertheimer, working with Ed Leeper in Denver, was the first to point to a link between leukemia and living near high-current power lines.

Two years ago, the International Agency for Research on Cancer (IARC) classified power-frequency EMFs as possible human carcinogens, based largely on an international consensus that epidemiological studies show that children exposed to EMFs have an elevated risk of leukemia (see *MWN*, J/A01). Three years earlier, a working group assembled by the NIEHS had reached the same conclusion (see *MWN*, J/A98).

Dr. David Carpenter, the director of the Institute for Health and the Environment at the State University of New York in Albany, called the NIEHS statement "outrageous." "Is this an error or does it reveal the institute's true view?" he wondered.

During most of the 1980s, Carpenter was the executive director of the New York State Department of Health's Power Lines Project, which funded the first major replication of the Wertheimer study—by Dr. David Savitz, now at the University of North Carolina, Chapel Hill (see *MWN*, N/D86). In its final report, the project estimated that 10-15% of all childhood cancers may be attributable to magnetic fields (see *MWN*, J/A87).

« Eye on Europe »

The U.K.'s Mobile Telecommunications and Health Research (MTHR) Program officially announced on March 20 that Prof. **Paul Elliott** of the Imperial College of Science, Technology and Medicine in London has been awarded £150,449 (US\$235,000) for an **epidemiological study of childhood cancer near base stations**. As we reported last December, the two-year project, which gets under way in April, will focus on leukemia and non-Hodgkin's lymphoma (see *MWN*, N/D02). Dr. **Lawrie Challis**, the chair of the committee that manages the MTHR program, said that he and the other panel members "feel strongly" that such research is needed. Epidemiological studies of the health impacts of base station radiation have been criticized (see below). MTHR also gave Elliott the go-ahead for a full-scale cohort study of brain cancer and neurodegenerative disease among phone users—the program had funded a pilot study last year (see *MWN*, J/F02). Previously, Elliott was part of a team headed by Dr. **Helen Dolk** of the London School of Hygiene and Tropical Medicine that confirmed elevated rates of childhood cancer near broadcast transmitters in Sutton Coldfield, near Birmingham, but concluded that data on cancer near 20 other U.K. transmitter sites provided "no more than very weak support" for a health risk (see *MWN*, J/F97). The third new project is an investigation of the incidence of headaches, fatigue and other symptoms, as well as effects on neuroendocrine function, among "normal" and "hypersensitive" volunteers who are exposed to RF/MW radiation. Dr. **Simon Wessely** of the New Medical School of King's College, London, received £394,247 (US\$616,000) for this three-year effort, which also begins in April. In addition, MTHR will manage a research project on the **TETRA** digital radio system used by the police and emergency medical workers—this will be paid for by other government agencies (see *MWN*, N/D01). More details on these research projects, as well as those funded last year, are available on the MTHR Web site, <www.mthr.org.uk>.

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On February 4, the **Health Council of the Netherlands** called for a large-scale **epidemiological study** of people exposed to **RF radiation**. The council's EMF Committee recommended looking at those who use mobile phones and, possibly, those who live near radio or TV transmitters—but not those living near mobile phone base stations. The committee, which is chaired by Dr. **Eric Roubos** of the Catholic University of Nijmegen, explained that the radiation levels near base stations are simply too low. Members of **COST281** expressed similar reservations in a "scientific comment" released at the end of last year (see *MWN*, N/D02 and J/F03). The need for and the difficulties in carrying out epidemiological studies of people living near base stations will be the subject of a May workshop held by COST281 in Dublin (see p.12). The Dutch advisors did, however, suggest "an experimental epidemiological study into the occurrence of subjective health complaints" associated with nearby towers. The health council also called for *in vitro* research on interactions between

Paris Adopts 2 V/m Limit for Mobile Phone Towers

The city of Paris has signed a formal agreement with its three mobile phone operators to limit residential exposures from mobile phone towers to 2 V/m, averaged over 24 hours. The limit applies to combined radiation exposure at both 900 MHz and 1800 MHz.

The new charter* was signed on March 20 by Bouygues Telecom, Orange and SFR, together with Bertrand Delanoë, the mayor of Paris. Representatives of the three companies said that less than 1% of the city's base station antennas will need adjusting to meet the new standard, according to *Libération*, a major newspaper (March 21).

The new Parisian standard appears to be even stricter than those of Switzerland (4 V/m) and Italy (6 V/m)—but these two limits specify maximum, not average, exposures. The ICNIRP limits are 41 V/m at 900 MHz and 58 V/m at 1800 MHz.

The agreement comes as a cluster of childhood cancer cases is under investigation in Saint-Cyr-l'École, outside Paris. To calm growing public fears, Orange and SFR turned off their mobile phone antennas in the area, *Le Monde*, one of the country's leading newspapers, reported on March 16.

Les Echos, a national business daily, presented the results of a poll which showed that 41% of the French population is concerned about mobile phone towers (March 27). The paper noted that there are 11,000 antennas in Paris alone.

*The Paris charter is available at: <www.paris.fr/fr/actualites/antennesrelais/charte.htm>.

RF/MW radiation and other chemical and physical agents, as well as dosimetry studies. To coordinate this activity, the panel called for establishing a "center of expertise" on EMFs and health. According to Dr. **Eric van Rongen**, the scientific secretary of the EMF panel, the new report presents "a somewhat broader view" of research needs than the council put forward in previous reports. But, he added, the committee's outlook on the possible health risks has not changed. Two years ago, the council endorsed established RF guidelines, such as ICNIRP's, for exposures from base stations and last year it advised against precautionary policies, such as limiting children's use of mobile phones (see *MWN*, N/D00 and J/F02; also M/J97). Van Rongen, who represents The Netherlands on COST281, told *Microwave News* that the council issued only a limited number of recommendations because there is basically no EMF research being done in The Netherlands and that "it would not be realistic to expect that large amounts of money would suddenly be made available." The government requested the report in response to concerns raised in a debate on tower-siting policies in the lower chamber of the Dutch parliament. **Health Effects of Exposure**

to Radiofrequency Electromagnetic Fields: Recommendations for Research is available in Dutch, with an executive summary in English, at: <www.gr.nl>.

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Sir **William Stewart** is back. Only a few months after resigning as the chair of the committee that oversees the U.K.'s mobile

Sweden's Radiation Protection Authority Under Scrutiny

It is the Swedish Radiation Protection Authority's (SSI) turn to be in the hot seat.

Not long after the SSI released a report that was sharply critical of Drs. Lennart Hardell and Kjell Hansson Mild's findings that mobile phones can promote brain tumors (see p.8 and *MWN*, S/O02), Swedish Television broadcast its own investigation of mobile phones and base stations—and took a close look at SSI.

The hour-long February 11 program, *Uppdrag Granskning (Mission: Investigate)*, challenged Ulf Bäverstam, SSI's research director, to explain why the institute is downplaying possible health risks. In addition to Hardell and Mild, the show featured interviews with Drs. Bertil Persson and Leif Salford of the University of Lund (see p.15 and *MWN*, J/F 03), as well as Drs. Pietro Comba of the National Institute of Health in Rome, Dariusz Leszczynski of STUK in Helsinki and Alan Preece of the University of Bristol, among others.

Reporter Johan Winberg asked about SSI's assertion, contained in a press release, that "the current state of the science is reassuring." After much badgering, Bäverstam disavowed this view and agreed that it would be appropriate to apply the precautionary principle to mobile phone radiation.

When *Microwave News* asked for confirmation that this is now SSI policy, Bäverstam declined to respond. He did send a comment noting that if the recent work by Persson and Salford showing nerve damage following leakage through the blood-brain barrier could be repeated by others, this would help explain some of the reported biological effects. "The research in this area must therefore be followed with great interest," he said.

Swedish newspapers continue to run feature stories and letters that examine SSI's confidence in current exposure limits. On March 26, for instance, *Aftonbladet*, a leading tabloid, pitted SSI's Gert Anger, arguing that 3G base station radiation is harmless, against Lund's Persson, countering that we really know nothing about such risks.

And later this year, Mild and Hardell, joined by Drs. Michael Kundi of the University of Vienna and Mats-Olof Mattsson, who like Hardell is at Örebro University, will offer a detailed critique of the SSI report. "Mobile Telephones and Cancer: Is There Really No Evidence of an Association?" will appear in the *International Journal of Molecular Medicine*. The SSI report at the center of the controversy was written by Drs. John Boice Jr. and Joseph McLaughlin of the International Epidemiology Institute in Rockville, MD.

phone research program in order to head up the newly created Health Protection Agency (HPA) (see *MWN*, N/D02), Sir William has become the chairman of the National Radiological Protection Board (NRPB). He took over from Sir **Walter Bodmer** on April 1, the same day that the HPA opened for business. The NRPB had been scheduled to become part of the HPA this year, but, for legal reasons, this has been delayed until 2004 (see *MWN*, J/F02). In another major change of management, Prof. **Roger Cox** will become the director of the NRPB on August 22, replacing Prof. **Roger Clarke**, who is retiring. Cox, who works on the health impacts of ionizing radiation, joined the NRPB in 1990 and is currently the head of its radiation effects department. And finally, Dr. **Jill Meara** has been appointed a deputy director of the board; she joins Dr. **John Stather**, who has held this title since 1997.

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Germany's €8.5 million mobile phone research plan (see *MWN*, J/A01) has been slowed down by **money problems**. The Federal Office for Radiation Protection (**BfS**), which is managing the effort, has put a number of projects on hold until further notice in response to a directive from the finance ministry to curtail spending. Dr. **Thomas Eikmann**, a senior environmental advisor to the government, told *Microwave News*. Germany is wrestling with a budget deficit that violates the EU's fiscal rules. Some grants have been awarded—for example, Dr. **Alexander Lerchl's** animal exposure studies are moving forward (see *MWN*, J/A02). According to those familiar with the program, the freeze primarily affects more speculative research that has a greater possibility of failing to produce conclusive results—for instance, studies on electrosensitivity. The BfS has repeatedly declined to provide details of any of the projects selected under the program. Meanwhile, funding constraints notwithstanding, the BfS has issued a second request for proposals, including submissions for animal studies on the potential of 3G phone signals to promote cancer and of GSM radiation to alter the permeability of the blood-brain barrier. In addition, the BfS would like to fund an investigation into the health and behavioral effects of base-station radiation on dairy cows (this has been a contentious issue in Germany for many years; see also *MWN*, J/A98 and N/D00). According to an announcement that appeared on its Web site, the BfS also wants to know more about SAR variations within the body and radiation levels associated with wireless local area networks and other emerging technologies. Proposals were due March 20.

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COST281, the European mobile phone research group, and **CENELEC**, the European standards organization, are embroiled in a dispute over guidelines for EMFs and RF/MW radiation generated by **household appliances**. In its 2002 *Watchdog Report*, issued last December, COST281 takes CENELEC to task for permitting a single appliance to produce levels as high as the ICNIRP limits, without allowing for similar fields generated by other nearby sources. Such guidelines "misuse public exposure limits," COST contends. In a letter to the EC, which authorized CENELEC to develop European product standards for non-ion-

izing radiation, CENELEC's secretary-general, **Pieter Parlevliet**, argued that the ICNIRP limits include "a large safety factor" and that ambient fields are negligible in comparison to the 1,000mG allowed by ICNIRP, pointing to residential surveys showing that 50Hz EMFs are on the order of 4-6mG. Such levels, Parlevliet wrote, are within the measurement error of the meters. COST281 Chair Dr. **Norbert Leitgeb** of Austria's University of Graz countered that **IARC** has linked exposures above 4 mG to a doubling of the risk of childhood leukemia (see *MWN*, J/A01). CENELEC's limits "convey the wrong signal to manufacturers," Leitgeb wrote. Instead, they should "be encouraged to make minimization of emissions a design criterion." Both the COST281 watchdog report and its February 3 letter to the EC, which includes excerpts from Parlevliet's letter, are available at: <www.cost281.org>.

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City officials in **Munich** are considering a novel approach to the problem of siting **mobile phone antennas** near schools, day care centers and hospitals. Base stations would be installed on the roofs of buildings used by such "sensitive" populations, *Süddeutsche Zeitung*, Munich's leading daily newspaper, reported on March 29. The idea is that most of the radiation will be directed to the horizon and away from children and the infirm. They would be directly underneath the antennas, where the RF levels are relatively low. "Clearly, I'll be boxed about the ears for this," Ursula Sabathil, the city councilor who introduced the plan, told the newspaper. "But sometimes one must take unpopular steps if it's better for children's health." Her proposal takes advantage of what is called the "lighthouse effect."

Motorola: Hands-Free Sets Do Reduce Radiation Exposures

Motorola researchers have formally countered claims, originally made by the U.K. Consumers' Association (CA), that hands-free sets used with mobile phones can increase radiation exposures.

In a paper published in the April issue of *Radiation Research* (159, pp.550-557, 2003), the Motorola team, headed by Dr. C.K. Chou, reports that computer simulations and measurements show that the specific absorption rate (SAR) in the ear region is approximately ten times lower when a hands-free set is used with a mobile phone.

The CA is not backing down, however. "Our practical advice remains that if you are concerned about radiation from mobiles, don't rely on a hands-free kit," Anna Butterworth, a CA spokesperson in London, told *Microwave News*.

The CA prompted international headlines in April 2000 when it warned that hands-free sets can triple the radiation exposure from mobile phones (see *MWN*, M/J00). The CA claim was based on measurements carried out by ERA Technology in Leatherhead. Despite numerous conflicting reports from other test labs, the CA has stood firm (see *MWN*, N/D00).

"No one finds the increases described by ERA," Chou, the director of Motorola's RF Dosimetry Lab in Plantation, FL, said in an interview. Chou's team charges that ERA used the wrong electric field probe to measure radiation exposures and failed to take into account effects of the user's body "which would reflect, scatter and absorb RF energy."

Dr. Philip Chadwick of MCL, a research and consulting firm based in London, is one of the many who think the CA has gotten it wrong. "Intuition, experience and analysis all would indicate that the SAR from the hands-free kit would be less than the SAR from the antenna," he told *Microwave News* in late March.

CA's Butterworth said that the association was not able to comment on developments that had occurred since it published

its warning in 2000: "Given...staff changes and the fact that the last active research we did on this was well over two years ago, we're not really in a position to comment on the theory behind the research that's taken place since then."

Blake Dismisses Headset Suits

U.S. District Court Judge Catherine Blake has rejected five class-action lawsuits that would force wireless companies to provide hands-free kits and health advisories with all mobile phones.

An appeal was filed on April 2.

Blake based her March 5 decision on two key arguments. First, the Food and Drug Administration (FDA) has determined that headsets are not needed to protect users from phone radiation. Second, if the suits were allowed to proceed, state courts could impose stricter standards than those adopted by the Federal Communications Commission (FCC), thereby violating the Telecom Act of 1996 (see *MWN*, M/A96).

Blake points to FDA's Web site, which advises consumers that, "Since there are no known risks...there is no reason to believe that hands-free kits reduce risks" (see <www.fda.gov/cellphones>; also p.18). While she allows that this "does not, of course, constitute regulatory action," Blake calls it "an important indication of agency purpose and opinion."

The lawsuits, which were originally filed in state court, are being coordinated by the Peter Angelos firm in Baltimore (see *MWN*, M/J01; also N/D01). The defendants filed a motion to dismiss the suits last August.

In September, Blake dismissed Dr. Christopher Newman's claim, also filed by Angelos, that phone radiation caused his brain tumor; the decision has been appealed (see *MWN*, S/O02).

A hands-free kit is commonly included free with a phone. In September 2001, AT&T Wireless began offering free headsets to all its customers (see *MWN*, S/O01).

European and Chinese Labs Report RF-Induced DNA Breaks

New experimental results from Europe and China have rekindled interest in the ability of RF/MW radiation to induce DNA damage.

In February, at a meeting hosted by the Institute of Physics in London (see p.12), Elisabeth Diem of Dr. Hugo Rüdiger's lab at the University of Vienna announced that two different cell lines—one human and one rat—had increased single- and double-strand DNA breaks following both continuous and intermittent exposures to 1800 MHz digital phone radiation, as measured by the comet assay.

Once again, as Rüdiger previously reported for ELF EMFs, the DNA damage was greatest for the intermittent exposures—that is, when the radiation was turned on for five minutes and then off for ten (see *MWN*, S/O02). With such exposures, statistically significant increases were observed at SARs of 1.2 W/Kg and 2.0 W/Kg.

Diem believes that the effects are not due to heating. If it was a thermal effect, she explained to *Microwave News*, there would have been more DNA damage with continuous exposures. Diem ran the RF experiments in Dr. Rudolf Tauber's lab at the Free University of Berlin, using an exposure system designed and built by Dr. Niels Kuster of IT'IS in Zurich. Kuster, Rüdiger and Tauber's teams are all members of the EC's REFLEX project (see *MWN*, M/A00).

Nearly ten years ago, Drs. Henry Lai and N.P. Singh of the University of Washington, Seattle, reported increased DNA damage in brains of rats exposed to 2450 MHz continuous-wave radiation (see *MWN*, N/D94). Dr. Joseph Roti Roti of Washington University in St. Louis, working under a Motorola contract, then found no damage in RF/MW-exposed cells (see *MWN*, J/F98 and S/O99). Since then, there had been no progress toward resolving the apparent contradiction (see p.19).

The new data “certainly cannot settle the conflict” between the two groups, said Dr. Franz Adlkofer of the Verum Foundation in Munich, the coordinator of the REFLEX project. In fact, he told *Microwave News*, “Both might be right.” Adlkofer suggested that some cell types may be more responsive to RF/MW radiation—as the Vienna group observed in its experiments with ELF EMFs.

In October 2001, Adlkofer reported that Tauber had seen increased DNA breaks in HL-60 cells exposed to 1800 MHz radiation, but he later voiced “doubts” about this finding (see *MWN*, N/D01 and M/J02). Now, with Diem's new results in hand, he believes that “the credibility gap is closed.”

On another front, in the December issue of *Biomedical and Environmental Sciences* (15, pp.283-290, 2002), researchers at Zhejiang University medical school in Hangzhou write that exposure to “low-intensity” (5.0 mW/cm²) 2450 MHz radiation increased the genotoxic effect of mitomycin C on human blood cells. The team saw no increase in DNA breaks in cells exposed to the radiation alone. These results appear to support that of Dr. Luc Verschaeve of VITO in Brussels (see *MWN*, N/D96). For details, contact: Dr. Ji-Liang He, <he_jiliang@hotmail.com>.

Russian Panel on Mobile Phones: Take a Precautionary Approach

On September 19, the Russian National Committee on Non-Ionizing Radiation Protection (RNCNIRP) adopted recommendations on the use of mobile phones, which appear below. They were translated into English for *Microwave News* by Dr. Vladimir Binhi of the Russian Academy of Sciences' (RAS) General Physics Institute in Moscow. Binhi, a member of the RNCNIRP, is the author of *Magnetobiology: Underlying Physical Problems* (see *MWN*, M/J02).

The RNCNIRP, which has 36 members, is chaired by Prof. Yuri Grigoriev of the Institute of Biophysics in Moscow. Other members include: O.A. Grigoriev, director, Center for Electromagnetic Safety; Prof. V.N. Nikitina, Northwestern Center of Hygiene and Public Health; Prof. Yu.P. Paltsev, Occupational Health Institute, Russian Academy of Medical Sciences (RAMS); and Prof. N.B. Rubtsova, Occupational Health Institute, RAMS.

In 1999, the RNCNIRP hosted a conference in Moscow to discuss harmonizing the exposure standards of the former Soviet bloc countries with those of the U.S. and Western Europe. Russia's limits are currently on the order of 100 times stricter than those of ICNIRP. The meeting ended without reaching any consensus (see *MWN*, N/D99). Nor was any progress made at a follow-up meeting held in Moscow last September.

1. The RNCNIRP offers the following advice on the safe use of mobile phones. These recommendations are based on the precautionary principle of the World Health Organization, published scientific and medical studies, reviews and recommendations by scientific groups and the expert opinions of members of the RNCNIRP.

1.1. Children under the age of 16 should not use mobile phones.

1.2. Pregnant women should not use mobile phones.

1.3. Those suffering from neurological disorders, memory loss or epilepsy and those with a predisposition to epilepsy should not use mobile phones. [Abridged list of conditions.]

1.4. The duration of calls should be limited to a maximum of three minutes, and after making a call the user should wait a minimum of 15 minutes before making another call. The use of headsets and hands-free systems is strongly encouraged.

2. Manufacturers and retailers of mobile phones should include the following information together with the engineering specifications:

2.1. All of the above recommendations regarding use.

2.2. All relevant health and epidemiological data on mobile phones, together with the radiation levels associated with the phone, and the name of the measurement lab.

Mobile Phones and Cancer: Two New Papers from Hardell

The research team led by Drs. Lennart Hardell and Kjell Hansson Mild of Sweden's Örebro University continues to see a cancer risk from mobile phones (see *MWN*, M/A02 and S/O02). The new results appear in two newly published papers.

A new analysis of the brain tumor data set offers a more consistent picture of the risk, Mild told *Microwave News*. "There is no question that the use of an analog phone for ten years or more leads to an increase in cancer," he said. But, Mild added, there is not the same clear indication for digital phones.

In the second paper, Hardell and Mild look at the chances of developing a neuroma, using a somewhat larger data set than in their previous papers. They continue to see a greater than three-fold increased risk among users of analog mobile phones. In addition, they point out that the incidence of neuromas has risen by more than 2% a year between 1980 and 1998. Could this be related to the use of mobile phones? "It's implied—it's there to be discussed," Mild said. Mild is also with the National Institute for Working Life in Umeå. (A neuroma is sometimes known as an acoustic neurinoma or a vestibular Schwannoma.)

In their neuroma paper, Hardell and Mild present three cases of men who reported having tinnitus in only one ear—the one they used for making phone calls. The inner part of the ear is an area of high exposure to microwaves from cell phones, they note.

L. Hardell, K.H. Mild and M. Carlberg, "Further Aspects on Cellular and Cordless Telephones and Brain Tumors," *International Journal of Oncology*, 22, pp.399-407, February 2003. (See also p.5.)

L. Hardell, K.H. Mild et al., "Vestibular Schwannoma, Tinnitus and Cellular Telephones," *Neuroepidemiology*, 22, pp.124-129, March-April 2003.

Australia To Track Health Complaints of Phone Users

Australia will soon become the first country to collect health complaints attributed to mobile phones.

The registry should start operating this spring, according to Dr. Colin Roy of the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), which is in charge of the new project.

An Australian senate panel recommended setting up the registry nearly two years ago, following its investigation into mobile phone safety (see *MWN*, M/J01). "It's an important first step," said Sen. Lyn Allison, who chaired the inquiry.

At the same time as it announced the registry on February 6, the government rejected Allison's call for a large and independent national RF research program and for a return to an earlier, more restrictive exposure standard. The other members of the senate panel did not endorse these recommendations.

"The government's response is better than nothing, but they should be doing a lot more," Allison told *Microwave News*. "For the price of two cappuccinos a year, mobile phone users could have been confident that real effort was going into the independent research," she said in a press release.

Last year, Dr. George Carlo, the head of the U.S. mobile phone industry's now-defunct research program, known as WTR, set up a health complaints registry using money from an out-of-court legal settlement (see *MWN*, M/A02). Repeated phone calls and e-mails to Carlo on the status of his registry were left unanswered.

Standards Watch

- **ICNIRP's** "Guidance on Determining Compliance of Exposure to Pulsed and Complex Non-Sinusoidal Waveforms Below 100 kHz with ICNIRP Guidelines" has been published in the March issue of *Health Physics* (84, pp.383-387, 2003). This addresses sources like electronic article surveillance systems, demagnetizers and metal detectors. The guidelines are available on ICNIRP's Web site, <www.icnirp.org>.

- A working group appointed by **ARPANSA** has begun writing a standard addressing exposures to **ELF EMFs** (see *MWN*, S/O02). According to Dr. **Andrew Wood** of Swinburne University of Technology in Melbourne, the chair of the nine-member panel, ARPANSA wants limits for workers and the public based on "established adverse health effects." At its first meeting, held on December 17, the working group decided to complete a draft for public comment by September 2004. Australia has no official standard for ELF EMFs, but the National Health and Medical Research Council has set interim limits of 1G for the public and

5G for workers—the same as ICNIRP's. Among the members of the working group are Thanh Dovan of SPI Powernet, Dr. Nick de Klerk of the Telethon Institute for Child Health Research in Perth and Dr. Pamela Sykes of Flinders University in Adelaide. The working group will be assisted by a 15-member consultative panel, including Dr. Mark Elwood, the director of the National Cancer Control Initiative in Melbourne, Richard Hoy of ESAA, Bruce Howard of TransGrid, Don Maisch, a consultant based in Tasmania, and Lyn McLean, the head of the EMR Association of Australia, which has pushed for more protective policies on ELF EMFs and RF/MW radiation.

- Since March 1, all mobile **RF/MW** transmitters and fixed antennas in **Australia** are subject to new regulations adopted by the Australian Communications Authority (**ACA**). The rules, which ensure that public exposures do not exceed the ICNIRP-based limits adopted by ARPANSA last year (see *MWN*, M/J02), are available at: <www.aca.gov.au>.

NCRP: Report on Wireless Safety For Building Owners Completed

The National Council on Radiation Protection and Measurements (NCRP) has completed its "letter report" on *Wireless Telecommunications Radiofrequency Safety Issues for Building Owners and Managers*.

The 37-page report, which was commissioned by McDonald's, the giant fast food company, offers guidance to corporations that control many buildings on their responsibilities for "ensuring the safety" of workers and the public exposed to RF radiation

from roof-mounted antennas (see *MWN*, N/D02).

Dr. Tom Tenforde, the president of the NCRP, chaired the committee that prepared the report. The other members are: Dr. Larry Anderson, Battelle Pacific Northwest Lab in Richland, WA; Dr. Jerrold Bushberg, University of California, Davis; Richard Tell, consultant, North Las Vegas, NV; and Susan Wiltshire, JK Research Associates (emeritus), South Hamilton, MA.

The NCRP has not officially announced the release of this report. A copy is available directly from Tenforde on written request. Write to: NCRP, 7910 Woodmont Ave., Suite 400, Bethesda, MD 20814, E-mail: <tenforde@ncrp.com>.

NCRP's RF/MW Panel Will Not Recommend Exposure Limits

NCRP's reconstituted committee on RF/MW biological effects will not recommend standards for exposures of the public and workers.

"Its report will not attempt to provide an updated set of exposure limits," NCRP President Dr. Tom Tenforde told *Micro-wave News*. Instead the panel "will provide a detailed critique of the strengths and weaknesses of the existing RF exposure guidelines," he said.

"I feel we can still make a positive contribution," said Dr. James Lin of the University of Illinois, the chair of the committee. Lin was first asked to prepare the NCRP report nearly eight years ago.

Tenforde explained that Lin has been asked to recommend what research is needed to address any deficiencies in the current standards. In addition, the panel will consider how best to communicate RF/MW health risks to workers and the general population.

Lin said that he expects to have a report ready for NCRP review in two years.

At the end of March, the first meeting of the new committee had yet to be scheduled. Lin was waiting for his budget to be approved so that he would have the money to assemble the panel members.

Tenforde is leading the effort to raise money for the panel's work, but no formal proposals have yet been submitted. It would be "premature to discuss any sources of funding," he said.

The NCRP's decision effectively cedes standard-setting authority to the IEEE International Committee on Electromagnetic Safety (ICES), also known as SCC-28, and the International Commission on Non-Ionizing Radiation Protection (ICNIRP). Tenforde is a member of ICNIRP.

Members of the ICES leadership have long sought to replace the NCRP as the dominant U.S. group for electromagnetic radiation standards (see, for example, *MWN*, M/A96). At the same time, ICES has been competing with ICNIRP for control on the international stage (see *MWN*, J/A00).

What is now the IEEE ICES committee was run by the U.S.

Navy in the 1970s and 1980s. The Navy's and the IEEE's RF/MW exposure standards have subsequently been approved by the American National Standards Institute (ANSI).

In its last major report on RF/MW health risks, issued in 1986, the NCRP recommended limits for the general public that, at the time, were five times stricter than the guidelines adopted by ANSI (see *MWN*, M/J86). Interestingly, Dr. Bill Guy, then of the University of Washington, Seattle, chaired both the NCRP and the ANSI committees.

The NCRP's directors disbanded Lin's RF/MW committee in the summer of 2001 because, they stated, the committee was taking too long to complete its report. At the time, concerns were raised regarding potential conflicts of interest because Ron Petersen, the NCRP vice president for non-ionizing radiation and a member of the board of directors, was also a member of ICES' executive committee (see *MWN*, S/O01). Last year, the board asked Lin to reconstitute the committee (see *MWN*, J/A02).

New NCRP RF Panel

The members of NCRP Scientific Committee (SC) 89-5 on the "Biological Effects of Radiofrequency Fields" are:

James Lin,* chair, University of Illinois, Chicago; Elizabeth Balcer-Kubiczek, University of Maryland, College Park; Paul Bottomly, Johns Hopkins University, Baltimore; Faith Davis, University of Illinois, Chicago; Keith Florig, Carnegie Mellon University, Pittsburgh; Om Gandhi, University of Utah, Salt Lake City; Mary Gilbert, Environmental Protection Agency, Research Triangle Park, NC; Greg Lotz,* National Institute for Occupational Safety and Health, Cincinnati.

Consultants:

Eleanor Adair,* New Haven, CT; Patricia Buffler,* University of California, Berkeley; C.K. Chou,* Motorola, Plantation, FL; George Harrison,* University of Maryland, College Park.

*Original members of the SC89-5, set up in 1995. Some changes were made five years later (see *MWN*, S/O95 and J/F00). All the panel members have doctorate degrees.

Towards Applying the Precautionary Principle: New Swiss Framework Looks Beyond Known Effects

Swiss government officials have developed a systematic framework that may be used to apply the precautionary principle to uncertain health risks. In contrast to traditional approaches, which recognize only demonstrated hazards, the Swiss model would allow the weighing of potential biological effects.

“It is not enough to ask whether something is established or not,” explained Dr. Jürg Baumann, the head of the non-ionizing radiation unit at the federal environmental agency known as BUWAL. “We have tried to devise a system that is more differentiated,” he said in a telephone interview from his office in Bern.

The new classification scheme assigns biological effects to one of five classes: “established,” “probable,” “possible,” “unlikely” or “unclassifiable.”

Established effects are those which have been reproduced in multiple labs, and for which a plausible mechanism exists—criteria developed and used by ICNIRP in setting its own standards.

According to BUWAL, changes in sleep patterns are examples of probable effects and increased rates of leukemia and lymphoma near radio and TV transmitters are seen as possible effects. In contrast, a general promotion of cancer is deemed unlikely and immunological effects are judged to be unclassifiable (see table below).

The framework, together with a host of examples, will be detailed in a review of the RF/MW radiation literature to be published by BUWAL this spring.

Baumann sees his new classification system as a variation on the methods used by the California EMF Program and by Germany’s Radiation Protection Commission. Unlike the quantitative analysis used by the California program, the Swiss system does not attempt to assign probabilities to various health outcomes. On the other hand, it allows greater shadings than the German method.

In the California report, three scientists combined their individual numerical probabilities of various risks into a consensus statement. They stated that they were “inclined to believe” that power-frequency EMFs can cause childhood leukemia, adult brain cancer, ALS and miscarriages (see *MWN*, J/A02).

Under the German classification system, health risks are either proven, under suspicion or suggested (see *MWN*, S/O01). The panel found that only the proven hazards warrant official recognition. It did not find any suspected or suggested risks.

Drs. Martin Rösli and Regula Rapp of the Institute of Social and Preventive Medicine in Basel reviewed the RF/MW health literature for BUWAL. A synopsis of their findings appears in the Spring issue of the BUWAL magazine, *Umwelt*. The full review will be available, in German,* in April.

“The report confirms what we have been saying for several years,” Baumann said. “It is absolutely clear that there is a potential for health effects at levels below the ICNIRP limits.” BUWAL proposed precautionary RF/MW limits in February 1999 and the Swiss government adopted them a year later (see *MWN*, M/A99 and J/F00).

Baumann noted that Switzerland did not set these precautionary limits on the basis of potential health effects. “They were set as low as technically and economically feasible,” he said, adding that, “The new classification system may provide an additional basis for precautionary action in the future.”

“It’s interesting that our review points to a number of effects—both probable and possible—that are below the ICNIRP standard, but only a few possible effects and no probable effects that are below our precautionary limit,” Baumann said.

*There will also be an executive summary in English, French and Italian. When released, all can be downloaded from <www.elektrosmog-schweiz.ch>.

BUWAL’s Classification of RF/MW Biological Effects

Established	Probable	Possible	Unlikely	Not Classifiable
ICNIRP criteria satisfied	multiple indications of an effect	isolated indications of an effect	no evidence of an effect; multiple indications of absence of an effect	very limited or contradictory data
thermal injury	changes in EEG, reaction times and sleep cycles; symptoms linked to mobile phone use but not verified, including headaches, dizziness, fatigue, skin warmth and increased pain sensitivity	leukemia and lymphoma near radio or TV transmitters; brain tumors from mobile phone use; sleep disturbances near transmitters; electrical sensitivity in some individuals	general increase in mortality or promotion of cancer	breast or eye tumors; immunological, hormonal, cardiovascular, psychological and teratological effects; miscarriages

Source: Vera Bueller, “Electrosmog: Caution Is the Best Medicine” (in German and French), *Umwelt* (published by BUWAL), pp.22-24, Spring 2003, available for download at: <www.umwelt-schweiz.ch>. In French, the magazine is called *Environnement*.

tionary principle. "It's sacrosanct in Europe—it's like motherhood and apple pie," he said. "As a result, it could stand for anything."

As Kheifets, who drafted WHO's position paper, wrote a couple of years ago while still working for EPRI, the U.S. electric utility research group, "the precautionary principle is vague" and "the specifics of implementation make all the difference."

Dr. Paolo Vecchia, a physicist at the National Institute of Health in Rome and a member of ICNIRP, is one of the few who is "far from convinced" that the European Commission intended the principle to be applied to EMFs. He says that many of the low-impact strategies discussed in his working group are "obvious and valid for any human activity and technology."

On the first day of the meeting, after a number of invited presentations, members of the public were given the opportunity to offer their opinions. (A report on the public session is available; see first item in list at right.) Then, over the next two days, 40 invited participants met in small groups to discuss when and how the precautionary principle should be applied.

By the close of the workshop, little headway had been made on devising a blueprint for future WHO recommendations.

"There was no clear guidance on what you do and what you don't do," said Dr. Christopher Portier, who served as the chairman of the Luxembourg workshop. Portier leads the Environmental Toxicology Program at the U.S. NIEHS in Research Triangle Park, NC.

Dr. Marco Martuzzi, an epidemiologist at the WHO Regional Office for Europe in Rome who helped organize the workshop, commented that, "It's obvious that some action on EMFs is warranted, but we were not trying to draw up a plan with specific recommendations at the meeting; rather the objective was to develop a framework for devising precautionary policies."

When asked what new policies he has in mind, Repacholi would only speak in generalities. "We want to look at ways of introducing precautionary measures into the EMF arena," he told *Microwave News*. He said that the principle would become an "overarching philosophy" for development of public health policies for EMFs, as well as for other health issues confronting the WHO, such as global warming.

Pressed for specifics, Repacholi suggested rerouting a power line or placing the conductors in a low-field configuration. "Try to keep the levels down without going overboard on costs," he said. But these strategies have been cited by the WHO as examples of prudent avoidance, which Repacholi endorsed in 2001 while still resisting invoking the precautionary principle (see *MWN*, S/O01). Most observers, however, see no more than a semantic difference between the two terms.

"WHO's position is still being developed," Repacholi said, adding that he plans to post a revised position paper on the precautionary principle on the project's Web site in early spring. (Go to: <www.who.int/peh-emf/en>.)

How To Address Power Line Health Risks?

Many of those at the meeting cited the decision by the International Agency for Research on Cancer (IARC) to designate power line EMFs "possible human carcinogens" as the prime reason to invoke the precautionary principle (see *MWN*, J/A01).

EMFs and the Precautionary Principle: Reading List

Application of the Precautionary Principle to Electromagnetic Fields (EMF), Conference of 24-26 February 2003 in Luxembourg, Rapporteur Report, 8 pp., March 20, 2003. Available at: <www.who.int/peh-emf/meetings/archive/en>. This report covers only the February 24 session, which was open to the public. The list of attendees is available at the WHO EMF project's Web site.

Q. Balzano and A. Sheppard, "The Influence of the Precautionary Principle on Science-Based Decision-Making: Questionable Applications to Risks of Radiofrequency Fields," *Journal of Risk Research*, 5, pp.351-369, 2002. See *MWN*, N/D02.

K. Foster, P. Vecchia and M. Repacholi, "Science and the Precautionary Principle," *Science*, 288, pp.979-981, May 12, 2000.

L. Kheifets, G. Hester and G. Banerjee, "The Precautionary Principle and EMF: Implementation and Evaluation," *Journal of Risk Research*, 4, pp.113-125, 2001. The entire issue is devoted to the precautionary principle. A different version of this paper is available at: <www.who.int/entity/peh-emf/meetings/southkorea/Leeka_Kheifets_principle_.pdf>

D. Kreibel, J. Tickner et al., "The Precautionary Principle in Environmental Science," *Environmental Health Perspectives*, 109, pp.871-876, September 2001.

"The Precautionary Principle," a special issue of *Public Health Reports* (117, November/December 2002), edited by J. Tickner. Includes a paper by R. Neutra and V. Delpizzo, "Transparent Democratic Foresight Strategies in the California EMF Program," pp.553-563.

WHO Regional Office for Europe, *Precautionary Policies and Health Protection: Principles and Applications*, Report on a WHO Workshop, Rome, Italy, May 28-29, 2001. Available at: <www.euro.who.int/document/e75313.pdf>. Addresses EMFs; many of those at this meeting also attended the February 2003 workshop.

Indeed, this was at the top of WHO's list of policy triggers.

But that is where the consensus stopped.

As Dr. Eric van Rongen of the Health Council of the Netherlands in The Hague reported from his working group meetings on the second and third days of the workshop, precautionary strategies can range from "providing information, performing research, up to reducing limits."

On one end of the spectrum stand Switzerland and Italy, which have each adopted precaution-based exposure limits. "We set out to see what could be done with available technology," said Switzerland's Dr. Jürg Baumann, who was also in Luxembourg (see also p.10).

On the other end is the U.S., where the NIEHS is limiting its activities on power-frequency EMFs to distributing literature and attending meetings. While Portier said that he believes the current data are adequate to trigger the precautionary principle and the institute is on record as favoring precaution, NIEHS has also been advising that children can live right next to a power line (see p.1). In addition, NIEHS has all but abandoned doing EMF health research.

Sweden was the first country to favor precautionary policies

Applying the Precautionary Principle to EMFs

for power-frequency fields. In 1995, five government agencies with responsibility for controlling human exposures endorsed a policy of prudent avoidance (see *MWN*, N/D95), which effectively bars new construction next to a power line or siting a power line in a residential neighborhood.

This February, Sweden took another step towards extending its EMF precautionary policies. According to Dr. Kjell Hansson Mild of the National Institute for Working Life in Umeå, the government, under orders from parliament, asked the Electrical Safety Agency to investigate how to reduce magnetic fields higher than 4 mG (0.4 µT) from power lines in residential areas. That is, the government is now considering—although somewhat reluctantly, according to Mild—applying precaution to all existing structures, not just new ones.

As for the U.K., Dr. John Swanson of the National Grid Co. refused to discuss how he or his company would view the siting of a new power line. A spokesman said that it was not “appropriate” for him to offer his opinions to the press.

Swanson was one of three industry representatives who were invited to the workshop as “observers.” All who were there said that everyone present participated equally in the discussions.

Repacholi explained that industry representatives cannot normally be members of any WHO working group, but he wanted all stakeholders represented at the meeting.

WHO Wary of Precautionary Policies in the Past

The decision to recommend precautionary policies marks the latest step in the evolution of WHO’s outlook. In a position paper released three years ago, Repacholi stated that the requirements for invoking the precautionary principle formulated by the European Commission “do not appear to be met in the case of either power [frequency] or RF EMFs” (see *MWN*, M/J00).

After IARC labeled ELF EMFs a possible carcinogen, the WHO project still shied away from openly recommending protective measures because, it stated, “we do not know what field characteristics might be involved in the development of childhood leukemia and therefore need to be reduced” (see *MWN*, S/O01). Indeed, as late as last year, the WHO released a booklet on *Establishing a Dialog on Risks from Electromagnetic Fields* which took no position on applying the precautionary principle to EMFs (see *MWN*, N/D02).

FROM THE FIELD

Meeting Notes

• Is it the surf or the science? Whatever the reason, the **Bioelectromagnetics Society** has received a record number of abstracts for its 25th annual meeting, to be held on the Hawaiian island of Maui. An extra day has been added and the conference will now run through Friday June 27. On that last day, the U.S. National Toxicology Program (NTP) is sponsoring a special session on *Carcinogenicity Studies of Cell Phone RF Radiation in Laboratory Studies*. An international roster of speakers has been lined up: Germany’s Clemens Dasenbrock, Switzerland’s Niels Kuster and Italy’s Morando Soffritti, as well as—and this should guarantee a standing-room-only crowd—Tim Kuchel and Mike Repacholi. Sparks will fly if the recent exchange of letters between these two Australians in *Radiation Research* is any guide. (Kuchel says he could not replicate Repacholi’s transgenic mouse study that famously points to an RF cancer risk, but Repacholi is far from convinced that Kuchel got it right; see p.18 and *MWN*, J/F03.) NIEHS’s Ron Melnick and NIST’s Perry Wilson, who are designing the NTP’s RF experiments, will also give presentations. Following these invited talks, there will be, as they say at the UN, a frank and open exchange of ideas.

• The abstracts of the papers presented at the U.K.’s **Institute of Physics** conference on *RF Interactions with Humans: Mechanisms, Exposure and Medical Applications*, held in London February 27-28, are posted on the institute’s Web site. Go to: <physics.iop.org/IOP/Confs/ENV>. Among the papers is the Austrian-German team’s report on RF-induced DNA breaks (see p.7).

New and Revised Listings

May 15-16: **COST281 Workshop: Mobile Phone Base Stations and Health**, Dublin, Ireland. Contact: Gerd Friedrich, FGF, Rathausgasse 11a, D-53111 Bonn, Germany, (49+228) 726220, Fax: (49+228) 7262211, E-mail: <info@fgf.de>, Web: <www.cost281.org>.

June 22-27: **25th Annual Meeting of the Bioelectromagnetics Society (BEMS)**, Outrigger Wailea Resort, Maui, HI. Contact: Gloria Parsley, 2412 Cobblestone Way, Frederick, MD 21702, (301) 663-4252, Fax: (301) 694-4948, E-mail: <bemsoffice@aol.com>, Web: <www.bioelectromagnetics.org>. The program is now available on the BEMS Web site.

July 1-4: **3rd International Congress on Low and Super-Low Fields and Radiation in Biology and Medicine**, State Regional Education Center, St. Petersburg, Russia. Contact: Organizing Committee, IAI RAS, Rizhsky Pr.26, St. Petersburg, 190103 Russia, (7+812) 251-8159, Fax: (7+812) 251-9173, E-mail: <congress@valuehost.ru>, Web: <www.science-congress.com>. Will cover electromagnetic, magnetic, gravitational and acoustic fields. Among the planned symposia will be one on *Theoretical Models and Physical Mechanisms of Low-Field and Radiation Actions on Bioobjects*.

August 24-29: **World Congress on Medical Physics and Biomedical Engineering**, Convention & Exhibition Center, Sydney, Australia. Contact: Congress Managers, (61+2) 9248-0800, Fax: (61+2) 9248-0894, E-mail: <wc2003@tourhosts.com.au>, Web: <www.wc2003.org>.

Hot New Papers

Paolo Bernardi et al., "Specific Absorption Rate and Temperature Elevation in a Subject Exposed in the Far Field of Radiofrequency Sources Operating in the 10-900 MHz Frequency Range," *IEEE Transactions on Biomedical Engineering*, 50, pp.295-304, March 2003.

"The electromagnetic field inside an anatomical heterogeneous model of the human body has been computed by using the finite-difference time-domain method; the corresponding temperature increase has been evaluated through an explicit finite-difference formulation of the bio-heat equation. The thermal model used, which takes into account the thermoregulatory system of the human body, has been validated through a comparison with experimental data. The results show that the peak specific absorption rate (SAR) as averaged over 10 g has about a 25-fold increase in the trunk and a 50-fold increase in the limbs with respect to the whole-body averaged SAR (SAR_{WB}). The peak SAR as averaged over 1 g, instead, has a 30- to 60-fold increase in the trunk, and up to a 135-fold increase in the ankles, with respect to SAR_{WB} . With respect to temperature increases, at the body resonance frequency of 40 MHz, for the ICNIRP incident power density maximum permissible value, a temperature increase of about 0.7°C is obtained in the ankles muscle. The presence of the thermoregulatory system strongly limits temperature elevations, particularly in the body core....If thermoregulation is inhibited, a relevant increase in the blood temperature is induced, with the blood that acts as a heat carrier and spreads heat from the point where its deposition is maximum (e.g., the ankle at 40 MHz), throughout the whole body. Therefore, even if power absorption is limited to one body region, temperature elevations will occur throughout the body....[I]t has been shown that the 50 safety factor used in the guidelines for setting the 0.08 W/Kg limit on SAR_{WB} is reduced to ten when maximum temperature increases are considered."

Reprints: Dr. Paolo Bernardi, Department of Electronic Engineering, University of Rome "La Sapienza," Italy, E-mail: <bernardi@die.uniroma1.it>.

Biao Shi, Behnom Farhoud, Richard Nuccitelli and Rivkah Isseroff, "Power-Line Frequency EMFs Do Not Induce Changes in Phosphorylation, Localization or Expression of the 27-Kilodalton Heat Shock Protein [HSP27] in Human Keratinocytes," *Environmental Health Perspectives*, 111, pp.281-287, March 2003.

"[W]e found that synthesis of HSP27 in human keratinocytes was not sensitive to EMF exposure. When cells were exposed to 100 μ T [1 G] EMF for 5 min, 30 min, 2 hr and 24 hr, the total levels of HSP27 demonstrated no significant change at any time point compared to the controls exposed to ambient EMF background. We further explored the possibility that the effects of EMF on heat shock proteins are specific for certain heat shock proteins or restricted to certain cell types by attempting to reproduce the results that Goodman and coworkers have reported. Our data demonstrate that the lack of HSP27 response to EMF exposure is not restricted to keratinocytes. Breast cells (HTB124) previously tested by Goodman and colleagues showed no significant change in abundance of HSP27 after exposure to EMF. Similarly, we were not able to observe any EMF-associated increase in HSP70 level using either breast cells (HTB124) or leukemia cells (HL60)....In summary, in this study we failed to detect any of a number of stress responses in keratinocytes exposed to power-line frequency EMF. Not only synthesis of heat shock proteins but also two other parameters of phosphorylation and translocation were not affected by power-line frequency EMF. Evaluation of these three parameters consistently demonstrated that EMF does not elicit the stress responses that are induced by heat shock or other environmental insults.

Low-Dose Microwaves Are Cataractogenic, Chinese Show

Juan Ye, Ke Yao, Qunli Zeng and Deqiang Lu, "Changes in Gap Junctional Intercellular Communication [GJIC] in Rabbits Lens Epithelial Cells Induced by Low Power Density Microwave Radiation," *Chinese Medical Journal*, 115, pp.1873-1876, December 2002.

"The underlying mechanisms of low-dosage microwave radiation-induced cataract remain to be investigated. Nevertheless, these studies clearly showed that both 5 mW/cm² and 10 mW/cm² microwave radiation for 3 hours [the ICNIRP exposure and the old ANSI exposure limits, respectively] caused the decreased function of Cx43 [connexin] and inhibited GJIC. Disruption of coordinated transport activity of the lens epithelial cells and inhibited delivery of ions and nutrients to fiber cells would be expected, perhaps leading to osmotic imbalance within the crystalline lens. We conclude that previously recommended microwave exposure limit is cataractogenic, and the safety remains to be tested. Our finding is expected to help to set a new standard in the future."

Reprints: Dr. Ke Yao, Department of Ophthalmology, Zhejiang University Medical School, Hangzhou, China, E-mail: <zjhzcycyk@mail.hz.zj.cn>. The paper is available at: <www.cmj.org/212qk/yejuan2.htm>; there are some problems with the computer translation of certain characters, however.

Reprints: Dr. Rivkah Isseroff, Department of Dermatology, University of California-Davis School of Medicine, E-mail: <rrisseroff@ucdavis.edu>.

Cornelia Baumgardt-Elms et al., including Andreas Stang and Karl-Heinz Jöckel, "Testicular Cancer and Electromagnetic Fields (EMF) in the Workplace: Results of a Population-Based Case-Control Study in Germany," *Cancer Causes and Control*, 13, pp.895-902, December 2002.

"Incident cases (n=269) were recruited between 1995 and 1997. A total of 797 controls matched on age and region were randomly selected from mandatory registries of residents. EMF exposure was assessed for five categories in standardized face-to-face interviews using closed questions....There was no excess risk for cases who reported to have ever worked near the following: radar units (OR: 1.0; 95% CI=0.60-1.75); radiofrequency emitters (OR: 0.9; 95% CI=0.60-1.24); electrical machines (OR: 1.0; 95% CI=0.72-1.33); high-voltage lines or high-voltage electrical transmission installations (OR: 0.7; 95% CI=0.38-1.18); or visual display units or complex electrical environments (OR: 0.9; 95% CI=0.67-1.21)....EMF exposure in the workplace does not seem to be a relevant risk factor for testicular cancer in our study....In our study, in which we distinguished five exposure categories ranging from ELF to EHF, including also a category with mixed frequencies, we could not observe an increased risk for testicular cancer in any of the categories. The risks did not increase with duration of exposure and decreasing distance from the source....In conclusion, a major reason for the incongruity of reported study results on occupational exposures to electromagnetic fields and testicular cancer stems from the difficulty of accurately assessing the exposure. The difficulty is magnified by the

FROM THE FIELD

fact that our understanding of the biological effects of EMFs is still scant....A...limitation may lie in the fact that our study does not take into account the detailed strength of the electromagnetic field; nor does it consider the effect of pulsed vs. non-pulsed frequencies. Thus, biologically essential aspects of exposure to EMF may not be correctly represented in this quantification concept. The effect of solvents, which are considered a potential confounder, was also not investigated.”

Reprints: C. Baumgardt-Elms, Department of Environment and Health, Hamburg, Germany, E-mail: <cornelia.baumgardt-elms@bug.hamburg.de>.

See also *MWN*, J/F01.

Hajime Kimata, “Enhancement of Allergic Skin Wheal Responses by Microwave Radiation from Mobile Phones in Patients with Atopic Eczema/Dermatitis Syndrome [AEDS],” *International Archives of Allergy and Immunology*, 129, pp.348-350, December 2002.

“26 patients with AEDS (14 women and 12 men, mean age 31 years, range 21-52) were studied. All of the patients were allergic to house dust mite and Japanese cedar pollen. They took no medication for 72 h prior to the study. In the microwave radiation study, 26 patients viewed a 60-min video featuring weather information, while having 26 mobile phones calling for 60 min without sound. Since it was difficult to hold the mobile phone to the ear for 1 h, it was tied around the neck by string and consequently placed 4 cm below the chin. In the control study, 26 patients viewed a 60-min video featuring weather information while having 26 mobile phones without calling....[T]he wheal responses induced by both house dust mite and Japanese cedar pollen allergens were not changed in the control study. In contrast, the responses were significantly enhanced by microwave radiation. This was not due to enhanced nonspecific irritation of the skin, as no enhancement of wheal responses was induced by control solution or by histamine in these subjects. The enhancement of wheal responses was still significant ($p < 0.05$) after 2 h...but not after 4 h.”

Reprints: Dr. Hajime Kimata, Unitika Central Hospital, Uji, Kyoto, Japan, E-mail: <unitikah@m12.alpha-net.ne.jp>.

Jong Hwa Lee et al., “How Much Are Anesthesiologists Exposed to Electromagnetic Fields in Operating Rooms?,” *Yonsei Medical Journal*, 44, pp.133-137, February 2003.

“We measured the amount of EMF exposure that an anesthesiologist gets in the operating room [with a Holaday HI-3604 meter]. The density of the magnetic field was checked by an extremely-low-frequency field strength measurement system in the 19 operating rooms of our hospital. We measured the magnetic field intensity at a distance of 30 cm, 50 cm and at the place where the anesthesiologist usually stands from the center of the main monitor....The ELF intensities were 0.56-4.25 mG ([average:] 2.22 ± 1.13 mG) at 30 cm, 0.47-3.19 mG (1.29 ± 0.84 mG) at 50 cm and 0.41-3.02 mG (1.00 ± 0.78 mG) at the anesthesiologist’s standing points.”

Reprints: Dr. Ki Jun Kim, Department of Anesthesiology, Yonsei University College of Medicine, Seoul, Korea, E-mail: <kkj6063@yumc.yonsei.ac.kr>.

Z. Weinberger and E.D. Richter, “Cellular Telephones and Effects on the Brain: The Head as an Antenna and Brain Tissue as a Radio Receiver,” *Medical Hypotheses*, 59, pp.703-705, November 12, 2002.

“The frequencies for transmission and reception by cellular telephones (800-900 MHz and 1800 MHz) include wavelengths of 33-35 cm and 16-17 cm, respectively. Human heads are oval in shape, and near the ear there will be a cross-section in the head with an axis either half the wavelength of RF/MW transmissions at 900 MHz or equal to the wavelength in the case of frequencies at 1800 MHz. Therefore, the human head can serve as a lossy resonator for the electromagnetic radiation emitted by the cellular telephone....In summary, since mobile phones broadcast specifically at frequencies at which the head serves as an antenna and brain tissue serves as a demodulating radio receiver, then it is reasonable to expect effects—adverse and otherwise—from bio-resonance at field strengths and specific absorption rates well below current thresholds.”

Reprints: Dr. Elihu Richter, Hebrew University, Jerusalem, Israel, E-mail: <elir@cc.huji.ac.il>.

“MICROWAVE NEWS” FLASHBACK

Years 20 Ago

- A *Lancet* editorial calls a U.K. study finding a higher mortality rate among electrical engineers due to leukemia “worrisome.”
- Jocelyne Leal and Jose Delgado in Madrid report that very weak pulsed magnetic fields have a “consistent and powerful” deleterious effect on developing chicken embryos.
- Sandia Lab concludes that EMP radiation from a high-altitude nuclear blast will not stop a nuclear power plant from shutting down safely. A government official calls the report an “embarrassment.”

Years 10 Ago

- Architects designing the new World Bank headquarters in Washington embrace prudent avoidance and use a number of techniques to reduce EMF exposures at “very little cost.”
- In its letter to *Science*, a White House radiation panel criticizes

Feychting-Ahlbom’s power line epidemiological study and calls EMF risks “weak and biologically implausible.”

- Rep. George Miller (D-CA) introduces the Children’s EMF Risk Reduction Act of 1993, which would bar utilities from exposing school children to power line fields that exceed 2 mG.

Years 5 Ago

- The U.S. Battelle Pacific Lab fails to repeat Germany’s Wolfgang Löscher and Meike Mevissen experiment showing that EMFs can stimulate the development of breast cancer.
- In Texas, tests reveal that digital TV technology causes widespread EMI, which renders certain cardiac monitors “useless.”
- Steel-belted radial tires can generate magnetic fields as high as 50 mG in the rear seats of automobiles, three U.S. consultants warn in a letter to *Microwave News*.

Across the Spectrum

“Irreproducible results can be blessings in disguise. It means that there’s some variable that you don’t understand.”

—Dr. James Watson, Nobel laureate, Cold Spring Harbor Lab on New York’s Long Island, in his forthcoming book *Manners and Rules for Scientists*, cited by Ricki Lewis in *The Scientist*, February 24, 2003

“Don’t Let Children Talk on Cell Phones.”

—Headline in *Aftonbladet*, “Låt Inte Barn Prata i Mobil,” January 31, 2003; Dr. Leif Salford, a neurosurgeon at the University of Lund, Sweden, is quoted by Johan Edgar (see *MWN*, J/F03)

“Passive mobile phoning, like passive smoking, may also soon be an issue.”

—Dr. Leif Salford commenting on his finding that mobile phone radiation increases permeability of the blood-brain barrier at levels as much as 1,000 times lower than the ICNIRP limit, quoted by Blaine Greteman in “Wireless Worries: A New Study Provides Fresh Evidence that Mobile Phones May Damage Brain Cells, Especially in Teens,” *Time* (European edition), p.47, February 24, 2003 (see *MWN*, J/F03)

A mysterious property of lightning has been confirmed. Just before a flash of lightning lights the sky, a huge blast of Xrays or other high-energy particles is released. The phenomenon means physicists may have to rethink how lightning is made.

—Nicola Jones, “Lightning Strikes Release Powerful X-Ray Bursts,” *New Scientist* (U.K.), p.18, February 8, 2003

I Have Seen the Future —And It’s Quite, er, Colorful

If you’re lucky enough to find yourself in the 18th-floor ballroom of the Beijing Hotel when the weather is clear and sunny, as it was one crisp day this past December, you’ll be treated to an amazing view of the Forbidden City, Tiananmen Square, and, if you lean way out over the terrace railing, the famous portrait of Mao Zedong. I, however, wasn’t looking at any of that, because the Korean guy in the chair in front of me was showing me a porno movie on his cell phone. Pretty good picture quality too....I had just caught my first really good look at our future. For there is no more convincing sign of a technology’s impending arrival than a naked woman writhing on a color screen....

—James Aley, “Heads We Win, Tails We Win” (on Qualcomm’s prospects in the emerging market for 3G communications technology), *Fortune*, p.142-144, March 3, 2003

“Ultimately this technology will enslave humanity.”

—Katherine Albrecht, privacy campaigner and doctoral student at Harvard University, Cambridge, MA, quoted by Simon London in “Radio ID Tags Spread Waves of Anger Among Privacy Activists,” *Financial Times*, p.22, March 1-2, 2003

UPDATES

IARC

New Head for Cancer Agency...In May, the WHO will appoint a new director of the International Agency for Research on Cancer (IARC), based in Lyon, France, to replace Dr. Paul Kleihues. The choice may well be important to the EMF community, given IARC’s plans to review the RF cancer data in 2005, as well as for the ongoing epidemiological study on possible cancer risks from mobile phones—known as the Interphone study—being run by Dr. Elisabeth Cardis (see *MWN*, M/A00). WHO Director-General Gro Harlem Brundtland listed the 30 candidates for the top job at IARC in a March 4 letter obtained by Bo Walhjalt, a Swedish freelance investigative journalist. (The letter is at: <www.gbg.bonet.se/bwf/docs/iarclist.pdf>.) Prof. Michel Coleman of the London School of Hygiene and Tropical Medicine, Dr. Christopher Portier of the U.S. NIEHS and Sir William Stewart, the new chair of the U.K.’s NRPB (see p.5), were on the list but not among those interviewed by the WHO in Geneva on March 10. Sources told *Microwave News* that the ten finalists include Dr. Hans-Olov Adami of Sweden’s Karolinska Institute and Dr. Peter Boyle of the European Institute of Oncology in Milan, as well as three senior IARC insiders: Drs. Paulo Boffetta, Elio Riboli and Harri Vainio. Adami, who has dismissed cell phone brain tumor risks and is a critic of Dr. Lennart Hardell (see p.8 and

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MWN, J/F01 and S/O01 and S/O02), received a letter of “complete and unreserved support” from Hans Wigzell, the president of the Karolinska Institute. Others, however, continue to be concerned over Adami’s work as a consultant to chemical companies. Boyle was a member of the study group set up by the Italian government which discounted the leukemia risk associated with the Vatican’s radio antennas in Cesano outside Rome (see *MWN*, S/O01). The U.S. had weighed in with a preference for Boyle over Portier, the sources said. An editorial in the January 18 issue of the *Lancet* called for a public discussion on “conflicts of interest, accountability and transparency” at IARC.

MEDICAL DEVICE EMI

Mobile Phones in Hospital...Some U.K. doctors believe it is time to relax restrictions on the use of mobile phones in hospitals. In an editorial in the March 1 issue of the *British Medical Journal*, Drs. Saul Myerson and Andrew Mitchell of the John Radcliffe Hospital in Oxford argued that, “[T]he evidence for serious harm is flimsy, and the hysteria that surrounds the [issue] is unjustified.” They point out that more EMI is generated by emergency room handsets than by mobile phones and that the phones only cause “temporary and very localized effects.” Myerson and Mitchell offer a “more sensible and considered approach,” such as permitting phone use in non-clinical areas and waiting rooms. A group of London doctors made a similar plea in a letter that, coincidentally, was published the same day in the *Lancet*. They reason that advances in technology during the past decade and the *de facto* use of mobile phones by medical personnel warrant a reevaluation. (For a different view, see “Hot New Papers,” *MWN*, J/F03.) In the U.S. Don Witters of FDA’s Center for Devices and Radiological Health told the *New York Times* (March 27) that the center continues to receive reports of EMI from cell phones to medical devices, but “not a large number.” He noted, however, that he believed that such incidents were greatly underreported because of the difficulty of tracing problems to a specific transmitter.

MICROWAVE WEAPONS

The Promise and Danger of HPM Weapons...High-power microwave (HPM) weapons are “likely to see operational deployment in the near future, probably the next decade,” writes Dr. Loren Thompson of the Lexington Institute in Arlington, VA. This and other not-so-surprising predictions—“The military impact of directed-energy weapons will be revolutionary” is another example—are contained in a 58-page report that was released in February. It covers the Pentagon’s “active denial” technology, or “people zapper” (see *MWN*, M/A01), as well as lasers and HPM weapons that can disable electronic equipment. *Directed Energy Weapons: Technologies, Applications and Implications* is available at no cost from the institute’s Web site, <www.lexingtoninstitute.org>. The mission of the Lexington Institute is to “inform, educate and shape the public debate of national priorities” in those areas that are important for national security, as well as education and tax reform.

PEOPLE

Dr. **James Lin** of the University of Illinois in Chicago will receive the d'Arsonval Award from the Bioelectromagnetics Society (BEMS) at this summer's annual meeting (see p.12). Lin has also been named an associate editor of *Bioelectromagnetics*, the society's journal. He will take over from Motorola's Dr. **C.K. Chou** in July. More immediately, Dr. **René de Seze** of France's National Institute for the Industrial Environment and Hazards has resigned as one of the other associate editors and has been replaced by Dr. **Maila Hietanen**, a member of ICNIRP who is with the Finnish Institute of Occupational Health in Helsinki. Both Chou and de Seze will remain on the editorial board....Dr. **Dariusz Leszczynski** has been promoted and is now the director of the Radiobiology Lab at STUK, the Finnish Radiation and Nuclear Safety Authority, in Helsinki....Last fall, Dr. **Robert Tarone** joined the International Epidemiology Institute in Rockville, MD (see p.5), after 29 years at the NCI....**Jimmy Dishner** is retiring from the U.S. Air Force's civilian service. Most recently he has been the executive director of the PAVE PAWS Project on Cape Cod, MA....Dr. **Bob Ashley** and his wife, Wanda, were in a car accident in Colorado the day after Christmas. Bob Ashley escaped relatively unscathed. Wanda Ashley suffered serious injuries, but will make a fairly complete recovery. Bob Ashley resigned from Minnesota's St. Cloud State University at the end of last year and they are now back home in Tampa, FL. He reports that the other driver was allegedly talking on her cell phone when she ran a red light and smashed into his Dodge minivan. "I know the real hazard of cell phones," he told us....**Alan Goldberg**, the law partner of **Ben Barnow**, died of a brain tumor last December at the age of 49. Goldberg and Barnow were the plaintiffs' attorneys in the *Busse v. Motorola* class action suit, originally filed in 1995. (It later turned into an invasion of privacy case; see *MWN*, J/F96, N/D01 and N/D02.) Barnow & Goldberg also represented Robert Kane in his brain tumor case against Motorola. That long-running case was filed nearly a decade ago and is still in the courts (see *MWN*, J/F94 and J/A00).

PROTECTIVE EFFECTS

Do EMFs Delay Brain Tumors?...Several labs have reported that RF/MW radiation can protect against cancer (see *MWN*, S/O02). Now researchers in Taiwan are suggesting that power-frequency EMFs may also have beneficial effects. Patients who had residential exposures above 2 mG (0.2 μ T) were on average nearly six years older (50.6 vs. 44.8) when diagnosed with brain cancer compared to those with lower exposures, a team led by Dr. Chung-Yi Li of Fu Jen Catholic University medical school in Taipei reports in the April issue of *Bioelectromagnetics* (24, pp.218-221, 2003). This is a significant finding. The largest difference in age (nine years) was in the "unclassified" brain tumor category. EMF-exposed patients with astrocytomas were four years older at time of diagnosis (not a significant finding), but there was no age difference for glioblastomas. EMF exposure was not associated with age of diagnosis for breast cancer or for leukemia. "Is it an artifact or is there a real delay? It's hard to say one way or the other," commented Dr. Gilles Thériault of McGill University in Montreal. Li was Thériault's doctoral student. Li

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himself sounded a note of caution: “I would regard this as a hypothesis-generating study,” he told *Microwave News*. “My view is that whether ELF or RF can influence cancer latency—either adversely or protectively—can only be investigated in animal models.” One of Li’s coauthors is Dr. Ruey Lin of National Taiwan University, who, close to 20 years ago, was the first to make the link between occupational EMF exposures and brain cancer (see *MWN*, O84).

TOWER SITING

Mayor Favors Restrictions...Seattle Mayor Gregory Nickels announced plans to prohibit cell towers in neighborhoods with single-family houses. In a March 24 statement, Nickels said that putting antennas in residential areas is “simply not a good fit.” The move was prompted by citizens angry about an agreement reached last September between the city council and T-Mobile USA—with Nickels’s blessing—to locate 18 antennas in communities where reception was spotty. “Seattle prides itself as a city that is technologically savvy, and this directive sets that back,” a dismayed T-Mobile official told the *Seattle Times* (March 24). Any changes to the agreement would be contested, she warned.

AS WE GO TO PRESS

SARS Not SARs...The EMF seminar scheduled to be held in Guilin, China, April 18-22, has been postponed until further notice due to the outbreak and spread of severe acute respiratory syndrome, or SARS.

Norwegian Phone Report...On April 2, the Norwegian Radiation Protection Authority released a report on mobile phones and health. It is available at <www.nrpa.no>, in Norwegian only.

Keeping Current: Follow-Up on the News

◆ Word has reached us from a number of sources that Dr. Leeka Kheifets will soon be leaving the WHO EMF project in Geneva. While noting that she does want to return to California, where she worked for EPRI before moving to Geneva, Kheifets told *Microwave News* that she has not submitted her resignation and has no immediate plans to come back to the U.S.

◆ Expect to see more letters in *Radiation Research* on the Uteridge-Kuchel experiment in which transgenic mice were exposed to mobile phone radiation (see *MWN*, S/O02 and J/F03).

◆ ICNIRP has released a summary of its report on *Possible Health Risks to the General Public from the Use of Security and Similar Devices*. The project, which was sponsored by EC’s Fifth Framework Program, addresses RF exposures from antitheft and RF identification (RFID) systems. The authors see no hazard, apart from possible EMI with pacemakers. Go to: <www.icnirp.org>. (See *MWN*, M/A00; also p.15.)

◆ In the March 1 issue of *Occupational Medicine* (53, pp.123-

127, 2003), Australia’s Drs. Bruce Hocking and Rod Westerman review a number of published case reports, including several of their own, describing neurological effects attributed to RF radiation (see, for example, *MWN*, S/O01). Their conclusion: Some of the cases described “are not consistent with” the hypothesis that heating alone can cause adverse effects.

◆ In February, the U.S. Air Force announced that its research lab has published a report on the *Biological Effects of Exposure to Ultrawideband (UWB) EM Energy*—but it is classified. For those with the appropriate security clearance, Report No.AFRL-HE-BR-TR-0248 is available from the Defense Technical Information Center.

◆ The FDA has posted on its Web site recommendations for exposure assessment work to be carried out before mobile phone epidemiological studies move forward. The posting, which is at <www.fda.gov/cdrh/wireless/fdarr.html>, was prompted by the General Accounting Office, which reminded the FDA to regularly update its Web site (see *MWN*, M/J01 and J/A01).

VIEWS ON THE NEWS

A Silly Mistake or A Leading Indicator

David Carpenter put his finger on the problem (see p.3). Did some low-level staffer at the NIEHS make a mistake in posting a notice that it is okay for children to live next to a power line? Or is it an accurate reflection of what the institute's bosses really think?

Mary Wolfe assured us it was all a misunderstanding. We find this hard to believe. We see this as a kind of Freudian slip—a window into the minds of those who set EMF policy at NIEHS.

There are strong indications that the boneheaded advice that EMFs are a non-issue reflects the view of a clique within the institute that has long believed that studying EMF health risks is a waste of time and money.

In 1992, when Congress picked the institute to lead a national research effort—the EMF RAPID program—NIEHS' Gary Boorman and his staff made it known that they would go through the motions and end up showing that the EMF cancer risk does not exist.

They then proceeded to make a hash of the whole program. The wrong studies got funded and nothing much got settled. But, at the same time, the epidemiological evidence pointing to a leukemia risk among children got stronger and stronger. It became impossible to dismiss—at least for those who were not members of the electric utility industry or the NIEHS clique (and, of course, some like-minded physicists).

Despite the clique's best efforts, an NIEHS working group

concluded in 1998, at the end of the RAPID program, that EMFs were indeed possible human carcinogens. That message was immediately watered down. The NIEHS issued a press release assuring everyone that there was really nothing to worry about (see *MWN*, J/A98).

Soon afterwards, the clique floated what looked like the EMF RAPID final report, which made no mention of the cancer risk. As one advisor to the program said at the time, "You would think we were in a different universe" (see *MWN*, J/F99).

Two years ago, when the International Agency for Research on Cancer (IARC) also labeled EMFs as possible human carcinogens, NIEHS' response was silence. It announced no new research initiatives. It issued no public advisories. It offered no recommendations on how to reduce exposures. Instead, the staff began drafting a booklet that sought to allay any lingering public concerns (see *MWN*, N/D02).

Who is running the show in Research Triangle Park? Is it Ken Olden, the director of the NIEHS, who told Congress four years ago that there should be "continued emphasis" on how to reduce exposures and who portrays himself as a protector of children's health? Is it Chris Portier, the head of the institute's Environmental Toxicology Program, who says he favors applying the precautionary principle to EMFs and who was one of those on the IARC panel who argued most strongly that the EMF cancer risk is no artifact?

Or is it the clique whose members thumb their noses at the international public health community and seem to be able to run their own show behind the backs of Olden and Portier?

Whither WHO?

As the NIEHS example discussed above makes all too plain, one can endorse precaution while favoring policies that are far from precautionary. (Even now that NIEHS' crass statement has been withdrawn, the institute has nothing in place that remotely resembles a precautionary strategy.)

So, although we welcome the news that Mike Repacholi and Leeka Kheifets are now embracing the idea that the precautionary principle should be applied to EMFs (see p.1), we await the specifics before raising our glass in a toast to their new outlook—lest we later find ourselves drinking the same old wine from a new, albeit politically correct, bottle.

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In our interview with Repacholi, we asked whether he would now discourage the use of mobile phones by children, a step endorsed by U.K.'s Stewart panel three years ago. Repacholi, a member of the Stewart group, had dissented from the majority view back then (see *MWN*, M/J00). He told us that he is still not ready to agree with Stewart.

We do not expect a radical change of outlook from the WHO, but we do look forward to some serious new recommendations. The credibility of the EMF project hangs in the balance.

DNA Breaks Redux

For a long time it has been the battle of the Washington universities: Henry Lai and N.P. Singh of the University of Washington, Seattle, versus Joe Roti Roti of Washington University in St. Louis. Now come the researchers working on the EC's REFLEX project who say that they, like Lai and Singh but unlike Roti Roti, see DNA breaks after RF exposures (see p.7).

Who's right? They all may be. As Franz Adlkofer, who leads the project, reminded us, there are many variables to be considered and the effect may come and go as they change.

One thing is already clear: The only way we will ever know what RF can do to us is by doing the research.

CLASSIFIEDS
