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Why Not Precautionary Limits?

NCRP Should Reinstate Its RF/MW Committee

IEEE Drafts Major Relaxation of RF/MW Human Exposure Limits

Cell Phone SARs Could Be 12 Times Higher

A committee of the Institute of Electrical and Electronics Engineers (IEEE) has drafted a significantly more lenient standard for exposures of the general public to radiofrequency and microwave (RF/MW) radiation.

IEEE's International Committee on Electromagnetic Safety (ICES), commonly known as SCC-28, wants to set a single standard for all segments of the population (see p.10). The fivefold safety factor that presently is used to give children, the elderly and the infirm more protection than workers would be eliminated.

Under the new standard, a draft of which was obtained by *Microwave News*, the specific absorption rate (SAR) limit for mobile phones would jump from 1.6 W/Kg to 10 W/Kg. The committee also wants to modify the way SARs are measured. The combined effect of the two changes would be to increase by more than 12 times the allowable human exposure to cell phone radiation.

Dr. C.K. Chou of Motorola in Plantation, FL, who is leading the effort to write the new standard, said that it will be ready for public release next June.

The proposed one-tier standard would limit whole-body exposures to 0.4 W/Kg. This level now applies only to workers, but would be extended to cover exposures for the general public, replacing the current 0.08 W/Kg limit. (For the major elements of the proposed standard, see p.10.)

Under the IEEE proposal, the measurable exposure limits for the general

(continued on p.10)

WHO EMF Project Now Endorses Policy of Prudent Avoidance

In a major policy shift, the World Health Organization's (WHO) International EMF Project has endorsed prudent avoidance.

On October 3, the WHO advised that decisions on siting power lines should "consider ways to reduce people's exposures." The WHO also recommended that governments and industry should offer the public "suggestions for safe and low-cost ways to reduce exposures." The advice is contained in a fact sheet on extremely-low-frequency electromagnetic fields (ELF EMFs) and cancer.

The project's new outlook follows the decision by an expert panel convened by the International Agency for Research on Cancer (IARC) to classify ELF EMFs as "possible human carcinogens" (see *MWN*, J/A01). IARC, which is based in Lyon, France, is part of the WHO.

Three years ago, in its last fact sheet on ELF EMFs and cancer, the WHO

(continued on p.3)

Japanese Leave Little Doubt 12 mG EMFs Can Inhibit Melatonin Effect; Report Progress Towards a Mechanism

Over the last ten years, one research team after another has shown that power-frequency EMFs can block melatonin's ability to check the growth of breast cancer cells. Now Drs. Masami Ishido and Hiroshi Nitta, members of Dr. Michinori Kabuto's research group at Japan's National Institute for Environmental Studies in Tsukuba, have settled remaining doubts that the effect is real.

What the Japanese researchers have been able to do is to pin down how a magnetic field can disrupt the cell's signaling system, which mediates melatonin's anti-proliferation effects. Still missing, however, is the physical mechanism by which a magnetic field can intervene and alter these biological processes. Ishido told *Microwave News* that the team is investigating ideas from theoretical chemistry, including radical-pair theory.

Nevertheless, Kabuto's group may have finally settled a controversy that has bedeviled EMF research for a generation: There are reproducible low-level magnetic field effects.

The Japanese group is the fifth lab to repeat an experiment first reported by Dr. Robert Liburdy in 1992: A 12 mG 60 Hz magnetic field can inhibit the oncostatic action of melatonin on MCF-7 breast cancer cells (see *MWN*, J/A92).

"It's an excellent piece of work," Dr. David Blask of the Bassett Research Institute in Cooperstown, NY, told *Microwave News*. "I'm satisfied that the work has been replicated. There is some-

thing there." Blask himself repeated the Liburdy experiment in 1993 and, in the years that followed, three other labs reported similar findings (see *MWN*, M/A96 and J/A98).

But without a mechanism to explain the action of such a weak magnetic field, skepticism continued. For instance, in its 1999 report to Congress, the National Institute of Environmental Health Sciences pointed to concerns "about the experimental design of these studies."

"This paper should be enough for physicists who are skeptical of a 12 mG effect to reconsider," said Dr. Richard Stevens of the University of Connecticut Health Center in Farmington. In 1987, Stevens put forward the hypothesis that EMFs could suppress, either directly or indirectly, the action of melatonin and thereby contribute to the development of breast cancer.

"Rational scientists now have to embrace the data," Liburdy told *Microwave News*. "Otherwise, they are obstructing science. We need to move forward."

Another key finding of the Japanese team is that only some types of MCF-7 cells are sensitive to magnetic fields. "We have been saying all along that not all MCF-7 cells are the same," Blask said. The variation in sensitivity could explain why some labs have had a hard time repeating Liburdy's experiment.

The new Japanese results appear in the July issue of *Carcinogenesis* (22, pp.1043-1048, 2001).

« Power Line Talk »

The NCRP may finally release its long-delayed ELF EMF report—but without the recommendations. "I have been suggesting for two years that we publish the report as a 1998 snapshot in time, with the recommendations taken out," Dr. **Charles Meinhold**, NCRP's president, told *Microwave News* (see also p.11). But, at press time, the chair of the NCRP committee responsible for the report had not yet heard of Meinhold's plan. "It's news to me," said Dr. **Ross Adey**. His committee sent the NCRP a completed draft six years ago, which called for strong action to limit exposures above 2 mG (see *MWN*, J/A95). The report has yet to emerge from the NCRP review process. Two years ago, Meinhold announced that the council would release a draft for public discussion by the end of 1999 (see *MWN*, J/A99). It didn't. Adey, who has been working on the report since 1983, dismissed the idea of leaving out the recommendations as "ridiculous." "It's another headless monster," he said.

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In an innovative new study, **South Africa's Dr. Linda de Jager** has found immunological effects among mice exposed to weak 50 Hz magnetic fields that varied over time. In a paper presented at the European Bioelectromagnetics Association meeting in Helsinki in early September, de Jager explained that she had used a variable exposure regimen to mimic the real-world environments

of those who had participated in power line—cancer epidemiological studies. The mice were exposed 24 hours a day to a magnetic field that varied between 5 mG and 770 mG—with an average exposure of 27.5 mG. After 14 weeks, the mice's immune surveillance system had a decreased capacity, she reported. De Jager, who is with Technikon Free State, a university in Bloemfontein, is preparing her results for publication as she plans follow-up studies.

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Dr. Robert Kavet is the new head of EPRI's EMF program in Palo Alto, CA. He takes over from Dr. **Leeka Kheifets**, who in July joined the WHO's International EMF Project in Geneva (see also p.3). Kavet, a longtime member of EPRI's EMF team, will also be responsible for EMC issues as well as a new program on RF safety to be launched next year. EPRI spokesperson **Jackie Turner** said that the EMF program could see some additional staffing changes, but that no decisions have been made.

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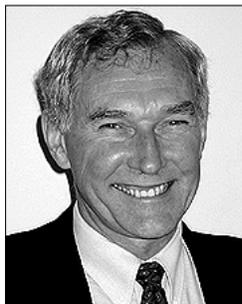
EPRI has issued a new report, *Communicating with the Public About Rights-of-Way: A Practitioner's Guide*, written by Dr. Teri Vierima of **Resource Strategies Inc.** in Madison, WI. It describes an eight-step plan to increase awareness and acceptance of new power lines. The report costs \$5,000.

project took a very different view. “There is no need for any specific protective measures for members of the general public,” it stated—beyond meeting the exposure limits recommended by the International Commission on Non-Ionizing Radiation Protection (ICNIRP). This standard protects against acute health hazards, such as shocks and burns, but does not address cancer risks.

At that time, Dr. Michael Repacholi, who oversees WHO’s work on EMFs, told *Microwave News*: “It is not WHO’s job to be recommending ‘prudent avoidance’ to national governments” (see *MWN*, N/D98).

As late as last year, the EMF project advised that prudent avoidance “may be justified,” but warned that “such actions should not be recommended by national authorities on health grounds.” Rather, they may be appropriate to deal with individual perceptions of risks (see *MWN*, M/J00).

Repacholi was traveling and did not respond to a request for comment.



“The lower the limits, the greater the public concern.”
—Dr. Michael Repacholi



“The precautionary principle cannot be applied to EMFs.”
—Dr. Paolo Vecchia

The WHO now joins Germany and the U.S., among other nations, in advocating prudent avoidance based on leukemia risks to children (see p.6 and *MWN*, S/O97 and J/A99).

The new WHO fact sheet is silent on the use of precautionary exposure limits such as those that have been adopted in Switzerland and Italy (see *MWN*, J/F00 and M/A00).

Repacholi continues to oppose them. “Precautionary policies should not be applied to EMFs,” he said in a talk at the opening session of the European Bioelectromagnetics Association’s (EBEA) annual meeting in Helsinki on September 6.

“Introducing ad hoc additional safety factors into science-based standards as a precautionary measure undermines hundreds of millions of dollars of research for no apparent benefit to health,” Repacholi said. Repacholi also argued that, “The lower the limits, the greater the public concern.”

Dr. Paolo Vecchia, the president of the EBEA, holds a similar view. “I’m still not convinced that the precautionary principle can be applied,” he said in an interview with *Microwave News*.

But, in a paper prepared for the EBEA meeting with two colleagues at the National Institute of Health in Rome, he wrote that invoking the precautionary principle is “justified” based on the EMF–childhood cancer risk. Vecchia, a member of ICNIRP, dismissed any apparent contradiction between the two statements.

Still Seeking Other Explanations For Childhood Leukemia Risk

WHO’s Drs. Michael Repacholi and Leeka Kheifets favor more studies on EMFs and childhood leukemia. They recommend “a follow-up, focused research program to provide more definitive information.”

“It remains possible that there are other explanations for the observed association,” they write in the new WHO fact sheet. “Selection bias in the epidemiological studies and exposure to other field types deserve to be rigorously examined and will likely require new studies.”

Both of these possible explanations were explored at the *13th Conference of the International Society for Environmental Epidemiology* in Garmisch-Partenkirchen, Germany, on September 4.

“We should seriously look at transients,” Repacholi said in his presentation, pointing out that they induce currents—a well-accepted mechanism of interaction.

Kheifets commented that the recent hypothesis, championed by EPRI’s Dr. Robert Kavet, that contact currents or electric shocks lead to a leukemia risk is at this point an “entirely theoretical” idea (see *MWN*, J/A00).

With respect to selection bias, Dr. Anders Ahlbom of the Karolinska Institute in Stockholm concluded that it alone is “unlikely to explain the EMF association.” The data, he said in his paper in Garmisch, suggest that at most it accounts for only part of the observed excess risk.

This view was endorsed by Dr. Dan Wartenberg of the Environmental and Occupational Health Sciences Institute in Piscataway, NJ. “Given the variety of different studies in different countries using different methods, it seems unlikely that they would consistently show bias in the same direction,” he said in an interview. (See also p.12.)

Dr. David Savitz of the University of North Carolina, Chapel Hill, told *Microwave News* that “selection bias remains a plausible source of the observed EMF–childhood leukemia link, though it’s very hard to know exactly how plausible it is in any quantitative terms.”

The WHO fact sheet notes that some epidemiological studies should help clarify these issues over the next two to three years. Kheifets, the manager of the radiation program, pointed to ongoing efforts in Italy and Japan as well as work by Dr. Patricia Buffler in California, though, she added, she doubted that they would offer final resolution.

When asked if ICNIRP will change its advice in light of the IARC decision, Dr. Alastair McKinlay of the U.K. National Radiological Protection Board (NRPB), the chair of the commission, said that any new policies would be decided at the national level.

Dr. Marco Martuzzi, who works for the WHO Regional Office for Europe in Rome, commented that some kind of precaution is warranted. “Different societies will make different choices based on the same data,” he told *Microwave News*.

The new fact sheet (No.263) is available on the Web at: <www.who.int/inf-fs/en/fact263.html>.

EMFs Take a Backseat in Wisconsin Power Line Battle

As a 250-mile, 345 kV transmission line across northern Wisconsin and Minnesota nears final approval, concerns over the health effects of EMFs are playing a secondary role to the question of need in the debate about the project.

More than 20 years of research have failed to show any association between health problems and exposure to EMFs, concluded Ave Bie, chair of the Public Service Commission (PSC) of Wisconsin at an August 17 meeting. Soon afterwards, the three-member panel unanimously voted to authorize Wisconsin Public Service Corp. (WPS), an investor-owned utility, to move ahead with the project.

Bie's outlook was consistent with that of Dr. John Moulder of the Medical College of Wisconsin in Milwaukee, who appeared as an expert witness for the electric utility. On February 22, Moulder testified that, in his opinion, EMFs do not cause or promote cancer (see box at right).

Moulder's assertions went largely unchallenged. Neither of the two main groups opposing the line—Save Our Unique Lands (SOUL) and the Citizens Utility Board (CUB)—presented an expert witness on EMFs and health. "Most of our group agreed that the health issue is key," said SOUL's Roger Steffen. "But we were told by other power line activists that it's not what's going to win it for us."

Steffen, who lives in Hawkins, WI, explained that his group could afford to hire just one expert—Dr. Richard Rosen, an electrical engineer at the Tellus Institute in Boston. "We were told by PSC staff that this would be decided solely on the issue of need," Steffen said. But the PSC dismissed Rosen's contention that the strain on the grid could be eased in other ways. Bie stated that the PSC's 10,000-page record demonstrated the need for the line.

Dr. Duane Dahlberg, an emeritus professor of physics at Concordia College in Moorhead, MN, testified on EMF health effects on behalf of two smaller opposition groups, Citizens United for Responsible Electricity (CURE) and the World Organization for Landowner Freedom (WOLF). Dahlberg has long maintained that stray voltage from power lines is harmful to people and farm animals.

The proposed line will run from Duluth, MN, to Wausau in central Wisconsin, where it will connect with the existing system, bringing power from the western U.S. and Canada. The route is almost entirely in Wisconsin, except for an approximately ten-mile-long segment to be built by Minnesota Power, a unit of Allete Co.

The line will cross a thinly settled section of Wisconsin and only a few residences are within 100 feet of the centerline, according to the PSC's environmental impact statement. (The full text is available at <www.psc.state.wi.us>.) But the Minnesota segment runs through the outskirts of Duluth, a city of more than 80,000, and will pass close to many homes.

Dr. Dan Bracken, an engineering consultant based in Portland, OR, estimated the EMF exposures likely to be associated with the line on behalf of the utility (see box at right).

Moulder: IARC Classification System Is "Outdated"

On February 22, 2001, Dr. John Moulder of the Medical College of Wisconsin in Milwaukee testified on behalf of Wisconsin Public Service Corp., the utility seeking to build a 345 kV power line (see story at left). Excerpts appear below. Moulder later disclosed that he charges \$180/hour as an expert witness and that he will receive up to \$36,000 for his work on the project. In June, a group assembled by the International Agency for Research on Cancer (IARC) unanimously classified EMFs as 2B: possible human carcinogens (see MWN, JA01).

Q: Have you reviewed the estimates of the magnetic field component of the [60Hz] fields [as high as 88 mG at 100 feet from the centerline] associated with the Arrowhead-Weston 345 kV transmission line?

JM: Yes.

Q: Do you believe that those fields pose a risk to human health?

JM: In my opinion, there is no consistent scientific evidence that [60Hz EMFs] of this magnitude produce any adverse effects on human health. While it is not possible in science to absolutely prove a negative, it is possible to say that this issue has been studied extensively by researchers and that no one has found consistent, reproducible evidence that [60Hz] fields of this magnitude cause an adverse effect on human health. Consequently, based on what we know today, it cannot be demonstrated that the [60Hz] fields calculated to be produced by this line create a risk to human health....

Q: [W]hy, in 1998, did a working group assembled by the NIEHS conclude that [60Hz] fields should be placed in IARC Class 2B as a "possible human carcinogen"?

JM: There appear to be several reasons for this statement by the working group....[It] had very little time to write the report (less than two weeks), its report was not peer-reviewed and the report is full of mistakes....[I]n the IARC classification scheme Class 2B is effectively the lowest category.

Q: Do you think that the working group misapplied the IARC guidelines in placing [60Hz] fields in Class 2B?

JM: Yes....

Q: If you were to use the IARC classification system, to what category would you now assign [60Hz] fields with respect to human cancer?

JM: The IARC classification system is outdated and is no longer particularly useful for classifying substances because it does not take into account our increased understanding of carcinogenesis. That is, it gives little weight to animal, cellular or mechanistic studies. But, if I were forced to use the IARC criteria, in my opinion [60Hz] fields should be placed in IARC Class 3: "Not classifiable as to carcinogenicity."

Q: Do you have an opinion...whether [60Hz EMFs] have been demonstrated to have adverse human health effects?

JM: I do. In my opinion, no causal relationship between exposure to [60Hz EMFs] and adverse human health effects has been established.

Q: What is the consensus of the scientific community...?

JM: The consensus of the scientific community is that [60Hz EMFs] have not been shown to adversely affect human health....

The PSC will instruct the utilities to use EMF-reducing wiring configurations "wherever possible," according to spokesperson Jeff Butson. Such measures will be spelled out in the commission's formal authorization for the project, which is slated to be issued by the end of October.

Steffen said that SOUL may mount a legal challenge of the

project. CUB has already filed suit in state court, alleging conflicts of interest in the PSC and improper changes in the utilities' proposal.

The project will now move forward unless a judge issues an injunction, Butson told *Microwave News*. Construction is expected to begin early next year.

An Assortment of New Epidemiological Findings

Peter Bethwaite, Angus Cook, Josephine Kennedy and Neil Pearce, "Acute Leukemia in Electrical Workers: A New Zealand Case-Control Study," *Cancer Causes and Control*, 12, pp.683-689, October 2001.

"The occupational and environmental exposure histories of 110 incident leukemia cases and 199 general population controls were compared....For subjects classified as having worked in one or more of the 'electrical occupations,' the degree of exposures to ELF EMFs was assessed in detail using a job-exposure matrix....An odds ratio of 1.9 (95% CI=1.0-3.8) was found for subjects who had ever worked in an electrical occupation. Significantly increased risks for leukemia are seen among welders/flame cutters (OR=2.8, 95% CI=1.2-6.8) and telephone line workers (OR=5.81, 95% CI=1.2-27.8)....A dose-response effect was also found, with acute leukemia risk rising with increasing occupational magnetic field exposure, based on both current and historical occupational field exposure estimates."

S. Davis, W. Kaune, D. Mirick, C. Chen and R. Stevens, "Residential Magnetic Fields, Light-at-Night and Nocturnal Urinary 6-Sulfatoxymelatonin [6-OHMS] Concentration in Women," *American Journal of Epidemiology*, 154, pp.591-600, October 1, 2001.

"[For] 203 women aged 20-74 years with no history of breast cancer...lower nocturnal urinary 6-OHMS level was associated with more hours of daylight, older age, higher body mass index, current alcohol consumption and current use of medications classified as beta blockers, calcium-channel blockers or psychotropics. After adjustment for these factors, higher bedroom magnetic field level was associated with significantly lower urinary concentration of 6-OHMS during the same night, primarily in women who used these medications and during times of the year with the fewest hours of darkness....The results reported here provide intriguing suggestions that exposure to magnetic fields in the home...at night is sufficient to depress the normal nocturnal rise in circulating melatonin....[T]hese effects were associated with relatively low levels of exposure and focus attention on the possibility that they occur primarily in persons whose melatonin levels are already low or perhaps are more susceptible to change." (See *MWN*, N/D97.)

Patrick Levallois et al., "Effects of Electric and Magnetic Fields from High-Power Lines on Female Urinary Excretion of 6-Sulfatoxymelatonin," *American Journal of Epidemiology*, 154, pp.601-609, October 1, 2001.

"A sample of 221 women living near a 735 kV line was compared with 195 women of the same age living away from power lines....After adjustment for other factors associated with low melatonin secretion, such as medication use or light exposure, nighttime concentration of 6-OHMS was similar in the two groups....However, the trend of decreasing 6-OHMS concentration with age was more pronounced for women living near the lines, as was a lower 6-OHMS concentration in women with high body mass index. Chronic residential exposure to magnetic fields from high-power lines may accentuate the decrease in melatonin secretion observed in some vulnerable subgroups of the population....Decreased nocturnal 6-OHMS concentration could be due either to a displacement of the secretion peak or a reduction in overall melatonin secretion. Our protocol could not distinguish these two...."

A. De Roos, K. Teschke, D. Savitz, C. Poole, S. Grufferman, B. Pollock and A. Olshan, "Parental Occupational Exposures to Electromagnetic Fields and Radiation and the Incidence of Neuroblastoma in Offspring," *Epidemiology*, 12, pp.508-517, September 2001.

"Cases were 538 children diagnosed...between 1992 and 1994 in the U.S. and Canada....Maternal exposure to a broad grouping of sources that produce [RF] radiation was associated with an increased incidence of neuroblastoma (OR=2.8; 95% CI=0.9-8.7)....Paternal average ELF magnetic field exposure >0.4 μT [4 mG] was weakly associated with neuroblastoma (OR=1.6; 95% CI=0.9-2.8)....Although our results are suggestive, a viable biologic mechanism has yet to be identified for a causal relation between parental exposures to [RF] radiation and neuroblastoma in offspring....The data indicate that any effect of paternal exposure to ELF EMFs is probably weak, and likely occurs only past an upper threshold of exposure. Our results indicate possible effects of maternal and paternal [RF] exposures on neuroblastoma, but the sparse data do not allow firm conclusions." (See also A. Olshan et al., "Neuroblastoma and Parental Occupation," *Cancer Causes and Control*, 10, pp.539-549, December 1999.)

E. van Wijngaarden, L. Nylander-French, R. Millikan, D. Savitz and D. Loomis, "Population-Based Case-Control Study of Occupational Exposure to Electromagnetic Fields and Breast Cancer," *Annals of Epidemiology*, 11, pp.297-303, July 2001.

"This...study examined occupational exposure to EMFs in relation to female breast cancer incidence among 843 breast cancer cases and 773 controls....Female breast cancer was not associated with employment as an office or industrial worker....Moderately elevated risks were found for intermediate but not high levels of cumulative exposure accumulated 20 or more years ago (OR=1.5; 95% CI=1.1-2.0). Associations were stronger for premenopausal women (OR=1.7; 95% CI=1.1-2.7) in the past 10-20 years, and those with estrogen-receptor positive (ER+) breast tumors (OR=2.06; 95% CI=1.1-4.0). No consistent dose-response patterns were observed....These findings give little support to the hypothesis that EMFs cause cancer of the female breast....The results of our study suggest an increased risk of breast cancer among premenopausal women with ER+ breast cancer cells in relation to employment as industrial worker, an occupational category with the highest measured exposure...." (See also *MWN*, S/O98 and J/F00.)

T. Sorahan, L. Nichols, M. van Tongeren and J. Harrington, "Occupational Exposure to Magnetic Fields Relative to Mortality from Brain Tumors: Updated and Revised Findings from a Study of United Kingdom Electricity Generation and Transmission Workers, 1973-1997," *Occupational & Environmental Medicine*, 58, pp.626-630, October 2001.

"The mortality experienced by a cohort of 83,997 employees of the former Central Electricity Generating Board...was investigated....[D]eaths from brain cancer were close to expectation (observed 158, expected 146.4). No significant positive trends were shown for risks of brain tumors either with lifetime cumulative exposure to magnetic fields or with such exposures received in the most recent five years....The U.S. five-utility study [Savitz & Loomis, 1995] provided positive findings; but given

the results from the other studies, these positive findings may well be due to chance.” (See also *MWN*, J/F95 and M/J01.)

David Savitz, “Occupational Exposure to Magnetic Fields and Brain Cancer” (editorial), *Occupational & Environmental Medicine*, 58, pp.617-618, October 2001.

“To help assess the current state of knowledge about cancer among electric utility workers, we recently undertook a coordinated analysis of three of the largest studies to examine differences in methods and attempt to reconcile results....At least for electric utility workers...we seem to have

a fairly complete answer for brain cancer. We may well be doing a disservice not to share the good news more energetically and widely—electric utility workers and other similar such workers do not seem to be at measurably increased risk of brain cancer....For now...on the restricted topic of typical time-weighted average occupational exposure to [EMFs] and brain cancer, further study of the type done thus far is not needed. This conclusion does not, however, apply to research on residential exposure; nor does it argue against the potential value of studies of occupational exposure to [EMFs] relative to less extensively investigated health end points, such as breast cancer or neurodegenerative disease.”

HIGHLIGHTS

Finns Find Cell Phone Link to Brain Cancer—But Dismiss It

A team of Finnish researchers led by Dr. Anssi Auvinen of the University of Tampere has found a significant association between the use of a mobile phone and the development of brain cancer. But Auvinen is discounting his own results.

In a presentation at the European Bioelectromagnetics Association (EBEA) meeting in Helsinki on September 7, Auvinen said that he has more confidence in the three recent epidemiological studies that did not see a mobile phone–cancer link. He was referring to U.S. studies conducted by the American Health Foundation and the National Cancer Institute and the study by the Danish Cancer Society (see *MWN*, J/F01 and M/A01).

Dr. Birgitta Floderus of the Karolinska Institute in Stockholm, who chaired the session, expressed surprise at Auvinen’s outlook. “It’s quite convincing to me that there is an association,” she said in the discussion period after his talk.

“It has to be taken in the context of other findings,” Auvinen replied. “The fact that [the others] did not find a risk outweighs our results.” He added: “If [ours] was the first and only study, I would put much more emphasis on the results.”

“Our study was designed as a feasibility study,” Auvinen later told *Microwave News*. “It’s more of a pilot study.”

The Finnish case-control study consisted of 398 brain tumors and 34 cancers of the salivary gland diagnosed in Finland in 1996. For those using the Nordic analog system, known as NMT, there was a statistically significant doubling of the risk of developing a glioma. For those who had used either an analog or a digital phone, the risk was 50% greater than expected.

Auvinen declined to review his results following his talk, arguing that doing so might jeopardize the chances of their publication. He said that he has submitted a paper to *Epidemiology*.

Auvinen is working on the Finnish component of the multinational epidemiological study being coordinated by the International Agency for Research on Cancer (IARC), known as the “interphone” study (see *MWN*, J/F98 and S/O98). Data collection is halfway completed in Finland, he said.

Also at the EBEA meeting, Dr. Elisabeth Cardis reviewed the current set of epidemiological studies and found them “inconclusive.” Cardis, the chief of IARC’s radiation and cancer unit in Lyon, France, and the head of the interphone study, said that at

German Radiation Commission Endorses Prudent Avoidance

Germany’s Radiation Protection Commission is recommending a policy of prudent avoidance.

In a report released on September 14, the panel—known by its German acronym SSK—states that it has confidence in the ICNIRP standards. But it calls for “minimizing” exposures to both ELF and RF/MW EMFs to the extent “technically and economically reasonable,” especially in locations where people spend extended periods of time.

The SSK recommends that emissions from consumer appliances, including mobile phones, be kept as low as possible and that product labels indicate emission levels.

The SSK also argues for more health effects research.

The Federal Environment Ministry, which is revising Germany’s EMF safety rules, requested the report (see *MWN*, S/O97). In July, the ministry announced that it was weighing precautionary exposure limits for mobile phone base stations, but would wait for SSK’s advice (see *MWN*, J/A01).

The SSK’s principal expert on non-ionizing radiation is Dr. Jürgen Bernhardt, who is the vice chair—and a past chair—of ICNIRP and a former head of Germany’s Radiation Protection Office.

On July 31, the radiation office’s current director, Wolfgang König, advised against the use of mobile phones by children and called for restrictions on base station antennas near schools and hospitals (see *MWN*, J/A01).

The full text of the SSK’s 56-page report, *Limits and Precautionary Measures to Protect the Public Against Electromagnetic Fields*, is available in German at <www.ssk.de>.

present one “cannot rule out the existence of a small individual risk of potential public health importance.”

Auvinen agreed that, overall, the data are “inconclusive.”

In his presentation, Auvinen pointed to a number of methodological problems that undermine his results. For instance, he was unable to identify the users of company phones. In addition, Finns under 18 are not allowed to have their own phone accounts and therefore their use cannot be tracked. He noted further that there was no information on which side of the head a user places a phone, nor on the model of the phone used or whether a hands-free set was used.

« Wireless Notes »

European health research on mobile phones continues to expand. The **European Commission** (EC) is adding two new projects to its already sizable RF/MW program (see *MWN*, M/A00). One is on potential impacts of mobile phone radiation on hearing and cognitive function; the other addresses possible neurological effects. **Callum Searle**, the EC program manager in Brussels, said that the contracts are still under negotiation and offered to give specifics when they have been finalized. In addition, another set of studies, which were coordinated by the Mobile Manufacturers Forum (MMF) and the **GSM Alliance** but were not funded by the EC program, will now go forward (see *MWN*, J/A99). These studies include a set of *in vitro* experiments as well as an animal experiment designed to repeat a behavioral study by Dr. **Henry Lai** of the University of Washington, Seattle. Dr. **Bernard Veyret** of the University of Bordeaux is coordinating this effort, known as PERFORM-B. It will be sponsored in part by the MMF and the GSM Alliance, as originally planned. In addition, each of the participating European labs raised matching funds from their respective national governments.

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At its first official meeting held in Brussels, September 26, **COST 281** elected Dr. **Norbert Leitgeb** of Austria's Graz University of Technology as its chair. He replaces Dr. **Ulf Bergqvist**, who died suddenly two weeks earlier (see p.16). Finland's Dr. **Maila Hietanen** and France's Dr. **René de Seze** are the vice chairs and FGF's **Gerd Friedrich** is the secretary of the new group on the *Potential Health Implications from Mobile Communication Systems*. COST stands for European Cooperation in the Field of Scientific and Technical Research. COST281 is coordinating a workshop in Brussels in October and working with FGF on its microdosimetry meeting in December (see p.14). In addition, members of COST281 are planning to write a response to Dr. **Gerard Hyland**'s recent report for the European Parliament (see *MWN*, J/A01). For more information, go to the committee's Web site <www.cost281.org>.

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A leading Swiss insurance company will contest paying any costs stemming from class-action lawsuits that would force phone manufacturers to provide headsets for mobile phones. On July 23, Zurich North America in Schaumburg, IL, a unit of **Zurich Financial Services Group** in Switzerland, asked state courts in New York and Texas to exempt it from paying any such claims, ac-

Swedish Scientists in Public Row over Statements to the Press on the Health Risks of Mobile Phone Radiation

Five prominent Swedish professors have attacked Drs. Lenart Hardell and Olle Johansson in an unsolicited letter to one of the country's leading daily newspapers.

Under the headline RESEARCHERS WHO TALK NONSENSE published in the September 3 *Svenska Dagbladet*, the five denounce those who fabricate and misrepresent data, exaggerate their results and speculate beyond their area of expertise. They cite no names but leave no doubt that they are taking aim at Hardell and Johansson's public statements on the health risks associated with mobile phones.

The five professors* specifically criticize a June 6 press release issued by Hardell and Dr. Kjell Hansson Mild, which describes their new study pointing to a brain tumor risk from the use of cell phones (see *MWN*, J/A01). "We feel it is inappropriate to discuss pilot studies in the media," they write.

They also dismiss as "probably a random finding" Hardell's observation, in a previous paper, that cell phone users are more likely to develop a tumor on the side of the head they used the phone (see *MWN*, M/J99). The professors contend that Hardell's interpretation of the data is "biologically bizarre."

Johansson is rebuked for telling the Swedish tabloid *Aftonbladet* (March 12) that mobile phones may lead to mad cow disease by allowing toxic proteins to pass through the blood-brain barrier.

"Scientists who report unpublished findings in the media or exaggerate their own findings do damage. This has happened

The letter was signed by Drs. Hans-Olov Adami, Anders Ahlbom, Anders Ekbohm and Magnus Ingelman-Sundberg, all of the Karolinska Institute in Stockholm, and Dr. Lars Hagmar of Lund University.

too often in EMF research and it destroys the reputation of the whole field," Dr. Anders Ahlbom told *Microwave News*. "Hardell has been doing a lot of this." Ahlbom is leading the Swedish component of the IARC "interphone" study on cancer risks from mobile phones (see p.6).

Both Hardell and Johansson see the letter as an attack on their freedom of speech. "The basic question is whether Sweden should allow scientists to debate new ideas in daily newspapers or if they should be controlled by a censorship board," Johansson said in an interview with *Microwave News*. Johansson, like four of those who wrote the letter, is at the Karolinska Institute.

In a reply published in the September 11 *Svenska Dagbladet* (ATTACKS ON INDIVIDUALS DO NOT HELP CANCER RESEARCH), Hardell charges that Ahlbom may not be fit to run the cell phone-brain tumor study: "If he has the preconceived notion that there is no link, then it is doubtful that he is sufficiently objective to direct the study." Hardell is a professor of oncology at Örebro University.

Hardell has also prepared a more detailed response, which reviews his work on dioxin and pesticides as well as on mobile phones. He calls the five professors a "little clique" that is waging a "sweeping smear campaign." The article will appear soon in the Swedish medical journal *Medikament* under the headline THE PRECAUTIONARY PRINCIPLE IS A WISER APPROACH.

Dr. Hans-Olov Adami, one of the signers of the letter, cowrote an editorial in the *New England Journal of Medicine* (January 11, 2001), which contended that the study by the National Cancer Institute "allays fears raised by alarmist reports that the use of cellular telephones causes brain tumors" (see *MWN*, J/F01).

HIGHLIGHTS

ording to an August 15 report from Mealey Publications, a leading source of information on insurance litigation. Zurich North America contends that the liability policies it issued to **Audiovox** and **Nokia** from 1987 until 2000 contain clauses that exclude damages such as those that could result from the lawsuits being mounted by **Peter Angelos** in Baltimore and others (see *MWN*, M/J01). The company also requested that it be released from any responsibility for the phone makers' legal bills. In 1999, Lloyd's of London stated that it would not cover mobile phone manufacturers for damages related to health risks (see *MWN*, M/A99). Zurich North America was previously known as Zurich-American Insurance Co.

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Is it the heat from the battery or the microwave radiation that is causing **headaches** among users of mobile phones? Dr. **Bruce Hocking**, one of the first to draw attention to such neurological symptoms (see *MWN*, N/D95), says that he now has clear evidence pointing to radiation. In a case report published in the September issue of *Occupational Medicine* (51, pp.410-413, 2001), Hocking and Dr. **Rod Westerman** write that a 31-year-old man who climbs towers and installs antennas suffered headaches after he was accidentally exposed to digital phone radiation from a low-powered base station. The tower worker also complained of fatigue and blurred vision, and had abnormal responses to nerve stimulation tests—a symptom that the two physicians, who are both based in Melbourne, Australia, have previously linked to phone use (see *MWN*, S/O00 and N/D00). They estimate that, during the 1-2 hours the antenna was left on, his exposure to the 900MHz CDMA signal was no higher than $60\mu\text{W}/\text{cm}^2$ —which they note is “well below current safety levels.” Hocking, who specializes in occupational health, and Westerman, a neurophysiologist, conclude that, because of the absence of confounders such as heat from the handset or the posture of the user, the case shows that “the previously reported unpleasant sensations...and permanent neurological changes” are due to RF/MW radiation.

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In **Singapore**, government officials are seeking to allay public concern about phone safety by citing reassurances from the **WHO International EMF Project**. “As long as the exposure is below international guidelines, it is safe,” Dr. Clarence Tan, the head of Singapore's Health Sciences Authority (HSA), told the *Straits Times* (August 17). Tan explained that, according to the project, radiation emitted by phones is too weak to damage tissue. The WHO's conclusions are “global benchmarks” and “definitive,” he said. Under rules issued by Singapore's Info-Communications Development Authority last year, SARs for GSM digital phones can be up to 10 W/Kg—the limit set by the U.K.'s NRPB (see <www.ida.gov.sg>). Tan discounted a survey by Dr. Sin-Eng Chia of the National University of Singapore that linked phone use to headaches (see *MWN*, J/A00). “It is always dangerous to take anecdotal evidence and generalize it,” he said. But the Consumers Association of Singapore (CASE) contends that the government is misrepresenting the WHO's position. CASE, which has been pressing the government to mandate phone labels with information on SARs and possible health hazards, sought clarification from Geneva. In an August 22 press release, CASE quoted

EMR Network: FCC Should Weigh Tighter RF/MW Rules

The EMR Network has asked the FCC to begin moving toward stricter RF/MW exposure guidelines. The network is an umbrella organization of grassroots groups fighting telecommunications towers.

“Leading scientists believe that the present standards may not adequately protect workers and the public,” Janet Newton of Marshfield, VT, the director of the EMR Network, told *Microwave News*. Previously, the network failed to convince a federal court to set aside the FCC's exposure rules (see *MWN*, N/D97, M/A00 and J/F01).

In a petition filed on September 25 by Washington attorney James Hobson of Miller & Van Eaton, the EMR Network contends that the 1992 ANSI/IEEE guidelines and the 1986 NCRP standard, on which the FCC's current rules are based, are out of date. The network wants the FCC to set the process in motion by issuing a “notice of inquiry.”

The petition cites extensively from a 1999 letter written by the government's RF Interagency Working Group outlining 14 issues that should be addressed “to provide a strong and credible rationale” for exposure guidelines (see *MWN*, J/A99 and also p.11).

The FCC has long maintained that it relies on the advice of government health agencies in setting RF/MW safety standards—for instance, the EPA, FDA, OSHA and NIOSH. In the October 2001 issue of the *Health Physics Society Newsletter*, FCC's Dr. Robert Cleveland writes that the FCC's RF/MW rules, adopted in 1996, are “largely based” on their recommendations.

An IEEE committee is in the process of revising its 1992 guidelines (see p.1), while a parallel effort by the NCRP has been scrapped (see p.11).

Dr. **Leeka Kheifets**, the EMF project's new manager, stating that, “Whilst current information does not point to the normal use of mobile phones as a health problem, the technology is new and there are gaps in knowledge which require further research.” The government is still trying to decide whether to require labels, the *Straits Times* reported. (See also p.18.)

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The **Swiss government** and the **wireless industry** are at odds over how to interpret the country's precautionary limits for RF/MW radiation from cell towers. The Federal Agency for Environment, Forests and Landscape (known as **BUWAL**) is proposing to tighten its rules—already the world's strictest—by including the radiation from *all* antennas at a given site when determining whether exposures exceed the 4 V/m ($4\mu\text{W}/\text{cm}^2$) limit (at 900 MHz). In an August 24 statement, the Swiss Information and Communications Technology Association (**SICTA**), an industry lobby group, maintains that such an interpretation would “hinder the development of mobile communications.” Instead, SICTA calls for treating antennas as separate sites as long as they are operated by different carriers. SICTA argues that this would have the aesthetic advantage of consolidating antennas, thereby avoid-

ing “forests of towers.” Switzerland’s law on non-ionizing radiation does not define an “installation” except for stating that it includes several antennas on the same tower or in “close proximity” to each other (see *MWN*, J/F00 and N/D00). Local officials have interpreted this language in various ways, prompting BUWAL to step in to ensure that the rules are enforced consistently across the country. The agency’s draft guidelines, released for public comment in March, define antennas as being part of the same site if they are within 100 meters of each other—in effect, leading to an ambient exposure limit of 4 V/m (see *MWN*, N/D00). In August, BUWAL expressed concern that the industry’s approach would result in “massive violations of the limits.” A final decision is expected next year.

Controversy Continues over Cancer near Vatican Antennas

An updated epidemiological analysis has again shown that rates of leukemia near the Vatican’s radio transmitters in Cesano, outside Rome, are higher than expected.

But these results have been sharply disputed by a panel convened by the Italian Minister of Health. In its report, released in mid-September, the four-member panel concluded that such studies have “little possibility of producing useful insights into the association between EMFs and leukemia.”

In a paper presented on September 4 at the *13th Conference of the International Society for Environmental Epidemiology*, held in Garmisch-Partenkirchen, Germany, Dr. Paola Michelozzi reported that the incidence of childhood leukemia was twice the expected rate within a 6km radius of the Vatican transmitters. This estimate is just short of statistical significance.

In addition, Michelozzi, who is with the regional health authority in Rome, found that the risk among males of dying from leukemia declined with distance from the radio antennas, as did the incidence of leukemia. Both of these trends are statistically significant.

Michelozzi cautioned that, while her results are consistent with those covering an earlier time period, they may be due to chance because the number of cases is small. “These are not conclusive findings,” she said. Nevertheless, she advised, some measures may be justified, “using the precautionary principle as a guide.”

The report to the Minister of Health takes a very different view, dismissing efforts like Michelozzi’s in no uncertain terms. It contends that there is no excess leukemia risk within 10km of the transmitters, that there is no trend of decreasing risk with distance from the antennas and that distance is an inappropriate surrogate for RF exposure. (See box at right for the report’s major findings.)

The four members of the panel, who have not previously worked on RF health effects, cite with apparent approval the assessment of the WHO EMF project that “the hypothesis that RF can cause or promote growth of tumors is highly unlikely.”

Michelozzi told *Microwave News* that she was disappointed with the health ministry’s report and that she is preparing a written response. She noted that the results of the panel’s reanalysis of the cancer data pointed to a statistically significant increase in

mortality among women living within 4 km of the antennas.

The panel was appointed by Dr. Umberto Veronesi, the former Italian Minister of Health, who has been an outspoken critic of those who are concerned about non-ionizing radiation. A few weeks before he convened the working group, he told the press that he was convinced that electromagnetic radiation is not a cancer agent (see *MWN*, M/J01).

The issue of electrosmog was front-page news in Italy for most of this spring. At one point, the Italian cabinet became so polarized that the minister of the environment, Willer Bordon, resigned—though only for a short time—when it appeared that the prime minister might not support his demand that the Vatican comply with Italy’s strict standard for RF/MW radiation.

On August 31, Radio Vatican announced that it would be in compliance with Italy’s 6 V/m exposure limit as of September 1.

Report to Italian Health Minister on Leukemia and Vatican Transmitters

Excerpted below are the conclusions of Current Status of Scientific Knowledge Concerning Radiofrequency Waves and Childhood Leukemia, with Specific Reference to the Situation in the Cesano Area, dated September 3 and released in mid-September.

The Italian Minister of Health requested the report on April 10, 2001. It was written by a four-member panel: Dr. Donato Greco, Laboratory of Epidemiology and Biostatistics, Istituto Superiore di Sanità, Rome; Prof. Peter Boyle, Imperial Cancer Research Fund, London, and the European Institute of Ecology in Milan; Dr. Giuseppe Masera, Pediatric Clinic of Monza Hospital, University of Milan; Prof. Roland Mertelsmann, Department of Hematology, University of Freiburg, Germany.

- Countless studies on animals, cell lines and other biologic models support an absence of a significant biologic effect of EMFs and RF such that it is highly unlikely that an effect exists in man.
- Ecologic studies, such as those conducted by the [regional health authority of Lazio] in the Cesano area, have little possibility of producing useful insights into the association between EMFs and leukemia, especially when precise data on individual exposure are lacking, and may result in public concern that is not subsequently validated by scientific data.
- The data examined did not show a relationship between the emissions of the Radio Vatican installation of S. Maria di Galeria and the incidence and death rate from childhood leukemia.
- The postulated association between distance from the installation and the declining incidence of childhood leukemia was not verified.
- The data...did not provide evidence that distance was an effective surrogate for the intensity of exposure of the population and therefore were not a valid measure of a possible association between exposure to the radio transmitter installation and childhood leukemia.
- The expected number of cases was too small to demonstrate, using ecologic study methods, an association between the exposure and the outcome.
- The difficulty in measuring exposure makes it difficult to draw meaningful conclusions.

population would increase from 200 $\mu\text{W}/\text{cm}^2$ between 100 and 300 MHz to 1 mW/cm^2 , or 1,000 $\mu\text{W}/\text{cm}^2$. At other frequencies, the power densities would be higher.

“The IEEE charged our committee to produce a science-based standard,” Dr. Eleanor Adair, the newly installed chair of SCC-28, told *Microwave News*. “It’s hard for many of us to justify a second tier based on sociopolitical considerations.” Adair is at Brooks Air Force Base (AFB) in San Antonio (see p.17).

Richard Tell, a consultant based in Las Vegas who is taking a leading role in drafting the new standard, said that the committee is not concerned about public reactions. “We are having a technical discussion,” he said.

But Ron Petersen, the secretary of SCC-28 and a member of its executive committee, acknowledged that there might be resistance to the new proposal. “A one-tier standard makes sense scientifically,” he said, “but politically it will be very hard to sell it.” Petersen recently retired from Lucent Technologies and is now a consultant based in Bedminster, NJ.

Adair, Petersen and Tell each said that the standard is still under discussion and could change in the months ahead. “A straw man has been proposed, but it has not yet been discussed,” Adair stressed. Tell said that, “It is a preliminary, internal draft.”

Meetings of the SCC-28 revision working group that developed the proposed limits, which is chaired by Motorola’s Chou, are closed to outside observers. Last year, Chou told *Microwave News* that, “The presence of the press is detrimental to free discussion” (see *MWN*, S/O00).

With the decision by the NCRP’s board of directors to stop the revision of its 1986 RF/MW exposure guidelines under the chairmanship of Dr. James Lin, the ICES standard will undoubtedly gain in importance (see p.11). “This probably means that in the future we will look to the IEEE and ICNIRP for guidance on exposure limits,” said Dr. Robert Cleveland of the Federal Communications Commission (FCC).

The FCC requires all new mobile phones to meet an SAR limit of 1.6 W/Kg, averaged over 1g of tissue. The proposal would not only raise the SAR to 10 W/Kg, but would also increase the averaging volume to 10g. Lin, for one, has strenuously opposed such a change in averaging volume, arguing that it is not “scientifically defensible” (see *MWN*, J/A00). He has stated that an SAR of 2 W/Kg averaged over 10g, the standard adopted by ICNIRP, is equivalent to an SAR of 4-6 W/Kg averaged over 1g (see *MWN*, N/D00). The new 10 W/Kg proposal would therefore be equivalent to an SAR of 20 W/Kg or greater, averaged over 1g.

Last summer, tensions between ICNIRP and the IEEE came out into the open, with members of each standards-setting group claiming that their limits are the ones that are based on science (see *MWN*, J/A00). Representatives from the two groups have met to try to iron out their differences under the banner of inter-

national standards harmonization, but it is not clear how productive those efforts have been.

Although the proposal that has emerged from Chou’s working group represents a major relaxation, Adair had sought an even greater loosening of the exposure limits. She had backed an alternative proposal for an SAR standard of 1 W/Kg—in effect, allowing public exposures to be increased more than tenfold. This proposal came to be known by the slogan “1-1-1”: 1 W/Kg, one tier, in one year. “It even rhymes,” commented a member of the committee.

Adair credited the 1-1-1 formulation to Dr. Martin Meltz of the University of Texas Health Science Center in San Antonio. She said that, while she still favors a 1 W/Kg limit, she “will go with 0.4 W/Kg, if that is the consensus.”

The committee’s preference for a single-tier standard emerged

at an SCC-28 meeting last year at which no representatives of the federal health agencies were present (see *MWN*, M/J00).

The new draft standard has not been widely circulated and it is not yet clear how federal health officials will react to the proposed loosening of the limits.

In 1999, Dr. Gregory Lotz of the National Institute for Occupational Safety and Health (NIOSH) wrote to SCC-28 on behalf

Current & Proposed IEEE Limits 0.1 MHz to 3 GHz (W/Kg)			
	Current[§]		Proposed
	PUBLIC	WORKERS	PUBLIC & WORKERS
Whole-Body Average	0.08	0.4	0.4
Spatial Peak	1.6*	8.0*	10.0 [†]
Extremities [‡]	4.0 [†]	20.0 [†]	25.0 [†]
*1 g averaging volume		†10 g averaging volume	
‡Hands, wrists, feet, ankles and the pinna of the ears.			
§IEEE C95.1-1991, Standard for Safety Levels with Respect to Human Exposure to Radiofrequency Electromagnetic Fields, 3kHz to 300GHz. The standard makes a distinction between “controlled” and “uncontrolled” exposures, rather than between the workers and the general public.			

One Tier or Two?

Whether the revised IEEE RF/MW standard should have one or two tiers was discussed at the IEEE SCC-28, Subcommittee 4 meeting held in St. Paul, June 8-9. Reprinted below is the discussion from the subcommittee’s unapproved minutes. For more on this debate, see MWN, M/J00.

[Dr. Mays Swicord of Motorola] said that one option is a single-tier standard that could be relaxed for certain occupational exposures under certain conditions. [Dr. Tom] McManus [of Ireland’s Dept. of Public Enterprise] pointed out that the report of the Stewart Independent Expert Group on Mobile Phones discredited the NRPB single-tier limits and recommended adoption of the ICNIRP recommendations in the U.K.—as a precaution. Swicord pointed out that the Stewart report was not a scientific response. In response to a question from [Dr. Martin] Meltz [of the University of Texas Health Science Center], Swicord said that the paper being prepared by [Dr. Linda] Erdreich [of E²ponent Inc.] and [Deborah] Sena [of Lucent Technologies] is the framework for a white paper—it essentially describes the choices but needs further discussion and review. [Dr. Aviva] Brecher [of the Department of Transportation] said that IEEE would lose credibility if a single tier is adopted. [Dr. Eleanor] Adair [of Brooks Air Force Base] disagreed, pointing out that if two tiers were adopted the decision would not be science-based but would be political—the same as was done in 1989.

of the federal government's RF Interagency Working Group (RFIAWG). Lotz listed 14 issues that those developing the new standard should address "to provide a strong and credible rationale to support RF exposure guidelines" (see *MWN*, J/A99). "We

are still hopeful that the SCC-28 will address those issues," Lotz told *Microwave News* at the end of September.

SCC-28's subcommittee 4, which is drafting the new standard, will hold its next meeting January 18-20 in San Antonio.

NCRP Disbands Committee Revising RF/MW Guidelines; Concerns Raised About Conflict with IEEE SCC-28

The board of directors of the National Council on Radiation Protection and Measurements (NCRP) has closed down its committee that was updating the council's report on RF/MW exposure limits.

In a September 6 letter to Dr. James Lin, the chair of NCRP Committee 89-5, NCRP President Dr. Charles Meinhold stated that the board believed that "timely completion of the report was unlikely."

Meinhold told *Microwave News* that Ron Petersen had recommended that the committee be disbanded because it was in the process of reorganizing for the third time, causing further delays. Meinhold also noted that the NCRP is having "a lot of financial problems."

"It looked like the committee would self-destruct," Petersen explained. He is the NCRP's vice-president for non-ionizing radiation and a member of the council's board of directors. Petersen is also the secretary of IEEE's SCC-28 committee, which is in the process of revising its own exposure limits (see p.1). Previously with Lucent Technologies' Bell Labs, Petersen recently became a consultant,

Dr. Marvin Ziskin of Temple University in Philadelphia, who is also on the NCRP board, said that, "The fundamental problem seems to be that the committee was dead in the water."

"I was quite surprised by the decision," Lin said in a telephone interview. "I was not consulted whatsoever." Lin is at the University of Illinois in Chicago.

Norbert Hankin of the Environmental Protection Agency in Washington was also startled by the news. "It came as a shock," he said.

A number of observers wondered aloud whether the longstanding rivalry between the NCRP and the IEEE's SCC-28 committee had colored Petersen's outlook and had led to the board's decision.

"I think that there was an obvious competition between the NCRP and SCC-28 and the NCRP lost," said NIOSH's Dr. Gregory Lotz, a member of the 89-5 committee. "I'm disappointed," he added. "It's a loss to the professional community."

Lin was charged with revising NCRP's report on *Biological Effects and Exposure Criteria for RF Electromagnetic Fields* six years ago (see *MWN*, S/O95). Drs. Eleanor Adair of Brooks AFB and C.K. Chou of Motorola were among those appointed to the committee to work with Lin.

Soon afterwards, in March 1996, as the Federal Communications Commission (FCC) was in the process of developing its RF/MW safety rules, the leadership of SCC-28 waged an intense lobbying campaign on behalf of its standard. Drs. Adair and Chou, accompanied by Dr. John Osepchuk and Ron Petersen and executives from the cellular phone industry, met with senior FCC officials in an effort to convince them to favor the IEEE

standard over the NCRP's (see *MWN*, M/A96).

In separate interviews, Adair, Chou and Petersen all disputed the view that the two committees are in competition. "I don't see a conflict," said Petersen. He denied that any such concerns influenced his dealings with Lin's NCRP committee.

When asked about the FCC incident, Lin responded that he had later gotten assurances from Adair and Chou: "They said that they would not denigrate the work of the committee in public or in private. From then on, I treated the matter as closed."

At the time he learned that the NCRP no longer wanted him to work on the RF/MW report, Lin was trying to line up new members and raise funds to support the committee's work. He was especially looking for a replacement for Chou, who after being appointed in 1995 had gone to work for Motorola in 1998.

Lin sought Chou's resignation in early 2000 after Chou had officially notified the NCRP that he had a conflict of interest with respect to completing a chapter on the effects of microwaves on the nervous system. "The conflict could, potentially, compromise the committee's deliberation on recommendations for exposure criteria," Lin wrote to NCRP President Meinhold on February 11, 2000. Lin provided a copy of this letter at the request of *Microwave News*.

Meinhold and Petersen tried to convince Lin to keep Chou on the committee. "As long as everyone knows where you stand," Meinhold said, referring to Chou's ties to industry, "I don't have a problem."

Lin said that affiliation with industry has never been one of his concerns. But, he added, when Chou stated in writing that he had a conflict, "I felt that I had no choice but to replace him."

For a year and a half, the committee's work was held up as the membership issue went unresolved. Lin said that he could not get Petersen to agree to replace Chou. Then, at the Bioelectromagnetics Society meeting in St. Paul last June, Chou said that he would resign. Chou sent Lin a follow-up e-mail on June 21 confirming his decision—with copies to Meinhold and Petersen and the other members of the committee.

Lin heard nothing more from Petersen or Meinhold until August 31, when, he says, he received a phone call from Petersen announcing that the board had decided on July 18 to disband his committee on RF/MW health effects.

In addition to Adair, Chou, Lin and Lotz, the original members of NCRP Scientific Committee 89-5 were: Drs. Patricia Buffler, University of California, Berkeley; George Harrison, University of Maryland, Baltimore; Richard Luben, University of California, Riverside; and Jan Stolwijk, Yale University. In 1998, Dr. Robert Liburdy of the Lawrence Berkeley Lab replaced Luben, but he later resigned, as did Stolwijk. Dr. Faith Davis of the University of Illinois, Chicago, joined the committee in 2000 when Buffler became a consultant rather than a full member.

Hot New Papers

Dale Jamieson and Daniel Wartenberg, "The Precautionary Principle and Electric and Magnetic Fields," *American Journal of Public Health*, 91, pp. 1355-1358, September 2001 (one of three papers on "The Precautionary Principle and Public Health").

"Despite the diversity of precautionary approaches, the public policy debate over the possible effects of exposure to EMFs has focused on regulatory extremes: Do nothing until the data are conclusive, or restructure major portions of the electric power delivery system. Regulations to limit the rate at which exposure is increasing by restricting construction of new power lines to the lower-exposure configurations met with fierce opposition in some locations from people who do not believe that the association between EMFs and cancer has been proven and thus contend that no action should be taken. Since the scientific uncertainty is unlikely to be resolved in the foreseeable future, policy decisions must be based on the possibility of risk and the cost and technology of reducing exposure. Whether such decisions should be dictated by personal choice in the marketplace (what to buy, which appliances to use) or governmental regulation (where to build or whether to modify the electric power delivery system) depends in part on how one views the precautionary principle and its implications."

María Isabel Cano and Marina Pollán, "Non-Hodgkin's Lymphomas and Occupation in Sweden," *International Archives of Occupational and Environmental Health*, 74, pp.443-449, 2001 (published in August).

"The base population was made up of Swedish men (1,779,646) and women (1,101,669) who were gainfully employed at the time of the 1970 census, had also been present in the 1960 census and were still alive and older than 24 years as of 1 January, 1971. They were followed up for 19 years until the end of 1989....There were 7,610 non-Hodgkin's lymphomas reported in the study cohort, 5,391 cases in men and 2,219 in women. A relative risk of over 1.20 and statistically significant was observed in men among accountants and auditors [1.71], secretaries and typists [2.11], auctioneers [3.95], nonspecified rail and road transport workers [3.08], telecommunications traffic officers [3.22], telegraph and radio operators [2.43], photographic-laboratory workers [3.19] and other production and related work [1.44]. The risk excess was confirmed in men with the same occupations in both censuses. In women, only three occupations achieved statistical significance: metal platers and coaters [6.36], truck and conveyor operators [4.15] and store and warehouse workers [1.54]. The risk excess observed in telecommunications and transport workers could be explained by electromagnetic radiation exposure."

Knut Skulberg et al., "Effects of Electric Field Reduction in Visual Display Units on Skin Symptoms," *Scandinavian Journal of Work, Environment & Health*, 27, pp.140-145, April 2001.

"On the basis of a screening survey of 4,556 office workers in 11 companies, 120 of 227 subjects reporting facial skin complaints were randomly selected to this double-blind intervention study. Antistatic measures were used to reduce the static electric fields of the visual display unit in the intervention group but not in the control group....The intervention group reported statistically significantly fewer facial skin complaints than the control group....Our findings provide some support for the hypothesis that exposure to static electric fields and dust may interact to cause skin symptoms among VDU users. However, the observation does not exclude additional causal factors, especially as there was still a non-negligible degree of symptoms after the intervention....The ELF electric field 30cm in front of the VDU was statistically significantly reduced by the intervention, but it failed to be a factor of importance in explaining the reduction in skin symptoms."

RF Effects at mW/Kg Levels

John Tattersall et al., "Effects of Low-Intensity Radiofrequency Electromagnetic Fields on Electrical Activity in Rat Hippocampal Slices," *Brain Research*, 904, pp.43-53, June 15, 2001.

"Slices of rat hippocampus were exposed to 700 MHz continuous wave radiofrequency (RF) fields (25.2-71.0 V/m, 5-15 min exposure) in a stripline waveguide. At low field intensities, the predominant effect on the electrically evoked field potential in CA1 was a potentiation of the amplitude of the population spike by up to 20%, but higher intensity fields could produce either increases or decreases of up to 120 and 80%, respectively, in the amplitude of the population spike.... The maximum field intensity used in these experiments, 71.0 V/m, was calculated to produce a specific absorption rate (SAR) of between 0.0016 and 0.0044 W/Kg in the slices. Measurements with a Luxtron fiber-optic probe confirmed that there was no detectable temperature change ($\pm 0.1^\circ\text{C}$) during a 15 min exposure. These results suggest that low-intensity RF fields can modulate the excitability of hippocampal tissue *in vitro* in the absence of gross thermal effects. The changes in excitability may be consistent with the reported behavioral effects of RF fields....During *in vivo* exposures at RF frequencies, most of the applied electromagnetic field will be absorbed by superficial tissues, such as skin, cranial muscles and the skull, and the amount of power reaching the brain will be greatly attenuated by this absorption process. Although the fields induced in deeper structures, such as the hippocampus, will be very much smaller than the external field, it is possible that the SAR in the hippocampus could approach that induced in the present experiments in brain slices, at least in rats and mice. The results of the current study are therefore consistent with the behavioral effects reported by Lai et al.,¹ although these are not as yet widely accepted. Due to the much larger size of the head and brain in humans, the proportion of the applied RF field reaching the hippocampus would be considerably smaller than in rats and mice; however, there may be a significant field in more superficial structures, such as the cortex, which would be consistent with the results of Preece et al.² and Koivisto et al.³"

1. H. Lai, A. Horita and A.W. Guy, "Microwave Irradiation Affects Radial-Arm Maze Performance in the Rat," *Bioelectromagnetics*, 15, pp.95-104, 1994.

2. A. Preece et al., "Effect of 915 MHz Simulated Mobile Phone Signal on Cognitive Function in Man," *International Journal of Radiation Biology*, 75, pp.447-456, 1999.

3. M. Koivisto et al., "The Effects of Electromagnetic Field Emitted by GSM Phones on Working Memory," *NeuroReport*, 11, pp.1641-1643, 2000.

Trevor Dawson, Krys Caputa, Maria Stuchly and Robert Kavet, "Electric Fields in the Human Body Resulting from 60 Hz Contact Currents," *IEEE Transactions on Biomedical Engineering*, 48, pp.1020-1026, September 2001.

"Contact currents occur when a person touches conductive surfaces at different potentials and completes a path for current flow through the body....Three pathways of contact current are modeled: hand to oppo-

site hand and both feet, hand to hand only and hand to both feet....The induced electric fields in the child model are higher than in the adult model, typically by a factor of two or three [because of its smaller size]. An analysis of the results in light of present exposure guidelines [e.g., ICNIRP] indicates a lack of consistency between the contact current reference levels and the basic restriction in the guideline. Namely, the reference level for general public (0.5 mA) results in induced current-density values which are 2.5-7 times greater than the basic restriction of 2 mA/m² for the spinal cord, and up to 17 times for the heart. The results indicate that as little as 5 μ A into the hand produces between approximately 20 mV/m (average) to 60 mV/m (95th percentile) within a child's lower arm bone marrow. Lower electric field values, but still greater than the benchmark 1 mV/m, are expected within the child's bone marrow at other sites. Because of body size differences, adults have lower fields/unit of current, about a third to one-half of the child's values. By comparison, a 60 Hz 1 μ T [10 mG] magnetic field, a level exceeded in virtually every residence away from appliances, produces less than 0.1 mV/m in a child's bone marrow." (See *MWN*, J/A00.)

Santi Tofani et al., "Static and ELF Magnetic Fields Induce Tumor Growth Inhibition and Apoptosis," *Bioelectromagnetics*, 22, pp.419-428, September 2001.

"In this study, the *in vitro* experiments were carried out with the aim of selecting MF characteristics able to influence apoptosis-like death induction. The selected MF were then used to expose animals. The most significant readings show that MF treatment impaired the growth of human colon carcinoma transplanted subcutaneously in nude mice and this effect was associated with an increase in apoptotic tumor cells. Although the study shows that MF are able to induce apoptosis-like death in transformed cells, both *in vitro* and *in vivo*, we cannot exclude that

the effects on tumor growth inhibition *in vivo* may be related to different mechanisms than apoptosis....The *in vitro* results, obtained using different MF characteristics, show that MF are able to induce apoptosis-like death when their intensity is higher than 1 mT and this effect does not depend upon MF frequency. This suggests that the biophysical mechanism connected to the apoptosis-like death induction may be more related to free-radical recombination processes than to ion-resonance-like mechanisms....Our data suggest that static and ELF EMF may have anti-cancer activity."

J. Babbitt et al., "Increased Body Weight in C57BL/6 Female Mice After Exposure to Ionizing Radiation or 60 Hz Magnetic Fields," *International Journal of Radiation Biology*, 77, pp.875-882, August 2001.

"Weanling C57BL/6 female mice were irradiated with four equal weekly cobalt-60 exposures (total cumulative doses: 3.0, 4.0, 5.1 Gy) and/or received chronic lifetime exposure to 1.4 mT 60 Hz circularly polarized MF or ambient MF. The body weights of 2,280 mice were recorded at 35 age intervals....A highly statistically significant effect of ionizing radiation on body weight was observed at 28 age intervals ($p \leq 0.001$), and for MF exposure at 10 age intervals ($p \leq 0.001$). During the young adult growth phase, mice exposed only to MF exhibited ≤ 0.5 g greater weight gain relative to sham-exposed controls ($p = 0.0001$)....The observed interactive effects of ionizing radiation and MF suggest that MF may have a stimulating effect on growth processes that have already been activated. In the absence of irradiation, the MF effect was observed during the normal growth phase of young animals (1.4 mT/0 Gy group). However, when MF exposure was concurrent with radiation-induced damage repair, the duration of the MF effect was related to radiation dose, and appeared to persist longer when higher doses and presumably greater damage were experienced."

On the Internet

SAR Sighting

The latest Web site on radiation exposures from mobile phones is <www.sarvalues.com>. It features SARs for 87 U.S. and 36 European models, with the highest and lowest units identified in separate lists. Although the site states that it is independent, it is in fact registered to Les Wilson of Enfield, U.K., a principal at Microshield Industries, which sells phone shields designed to reduce radiation exposures. (There is a link to Microshield's Web site.) A disclaimer states that "materials at this site are directed solely at those who access this site from the U.K. mainland." In 1997, Microshield agreed to curtail its U.S. marketing after Motorola threatened legal action over what it called "grossly misleading" statements in the shield maker's product literature (see *MWN*, M/J97).

Comet Assays

If you want to keep up with the community of genetic toxicologists and molecular epidemiologists who work on identifying DNA breaks, check out <www.cometassay.com>. Ever since Drs. Henry Lai and N.P. Singh of the University of Washington, Seattle, reported genetic damage in the brain cells of rats exposed to 2450 MHz radiation seven years ago, the comet assay has been a major interest among EMF researchers (see *MWN*, N/D94). The Web site features a brief overview of the technique, pioneered by the Swedish researchers Drs. O. Östling and K.-J. Johanson in the early 1980s. A later version

developed by Singh—the alkaline comet assay—is the most widely used today. The site features the full texts of selected papers and information on upcoming meetings. For instance, there will be a workshop on recent advances and new applications at the *8th International Conference on Environmental Mutagens* in Shizuoka, Japan, October 21-26. You can even join the ongoing discussion forum. The site is maintained by Dr. Bharathy Kumaravel of the University of Toronto and her husband, Dr. T.S. Kumaravel of the Ontario Cancer Institute.

Phone Tower near School

The New Jersey Department of Environmental Protection (DEP) has posted the results of its survey of microwave exposures at a school near a wireless base station at <www.state.nj.us/dep/rpp/ber/nrs/hinella.htm>. VoiceStream and AT&T Wireless placed PCS antennas on a water tower immediately adjacent to the Samuel Yellin school in Stratford. In February, the DEP measured 1 μ W/cm² (2 V/m) at the school, which is 0.02% of the state's regulatory limit. To emphasize the difference between the observed level and the health standard, the DEP includes bar graphs that look like a mud hut next to the Empire State Building. VoiceStream's worst-case calculation points to levels possibly as high as 30 μ W/cm² (11 V/m). "It should be noted that these worst-case predictions grossly overestimate anticipated levels, even with all channels operating at full power," the DEP states.

Notes on Conferences, Meetings, Workshops

- Dr. **Robert Cleveland** of the FCC will head the U.S. delegation to the October 29-30 workshop on mobile phone health risks in Brussels. Representatives from the EU, Japan and Korea will also be there. The new **COST281** committee on potential health effects of wireless phones is coordinating the meeting, which is being hosted by the European Commission (see also p.6 and p.16). The first day of the by-invitation meeting will be devoted to talks by Sweden's Dr. **Kjell Hansson Mild**, Japan's Dr. **Masao Taki** and France's Dr. **Bernard Veyret**, followed by presentations by members of each of the four delegations on regulations, ongoing and future research, science policy and risk communication. On the second day, which will be closed to outside observers, the four delegations will discuss possible future coordination and collaboration. Proceedings will be prepared. WHO's Dr. **Leeka Kheifets** is chairing the workshop. The other members of the U.S. delegation will be: Dr. **Jerry Bushberg** of the University of California, Davis, Drs. **C.K. Chou** and **Joe Elder**, both of Motorola, Dr. **James Lin** of the University of Illinois, Chicago, and FDA's Dr. **Russell Owen**.

- The Italian EMF establishment is trying to dissuade scientists from attending an October 20-21 meeting on electrosmog. In a September 20 "Dear Colleagues" letter, Dr. **Paolo Vecchia**, a physicist at the National Institute of Health in Rome, warned that those who do go to **Ischia** might be placed in the embarrassing predicament of being asked to sign a radical position paper—as happened at last year's Salzburg conference on mobile phone towers (see *MWN*, J/A00). The Ischia meeting is being sponsored by the National Consumer Association (CODACONS), according to Dr. **Fiorenzo Marinelli** of the National Research Council in Bologna, one of the organizers. But Vecchia says the real force behind the meeting is a group of lawyers who are fighting electrosmog. The members of the conference's scientific committee "can hardly be found in the literature or in the list of participants in scientific events of BEMS, EBEA, COST, URSI etc. However, you can find them, for example, in the program of the Salzburg conference," Vecchia wrote. In an e-mail to *Microwave News*, Marinelli said that the problem of exposure to electromagnetic radiation should be solved with "an open mind and scientific honesty, not by fighting."

- A *Workshop on Electrosensitivity* was held in Stockholm, September 27-28. The meeting was organized by the Swedish Association for the Electrosensitive with the financial support of the Swedish government's Inheritance Fund. "The workshop was a success," said **Hélène Aastrup Samuels**, the project coordinator. "Everyone wants it to be repeated, annually or biannually." The abstracts of the papers presented at the meeting are available at <www.feb.se/NEWS/Abstracts010927.pdf>. Samuels is a radiojournalist and documentary filmmaker. Among her works is *Radiant Future*, a film on the life of a young man who is electrohypersensitive.

- The December 17-19 **FGF** workshop in Dresden is the third in a continuing series of industry meetings on mechanisms of interaction. (**COST281** is helping organize the meeting.) "It will

Calendar

October 20-21: **Electromagnetic Radiation—One Science One Truth**, Lacco Ameno, Ischia, Italy. Contact: Dr. Fiorenzo Marinelli, Cytomorphology Institute, National Research Council, Via di Barbiano 1/10, 40136 Bologna, Italy, (339+051) 636-6755, Fax: (339+051) 583-593.

October 22-24: **WHO Meeting on EMF Biological Effects and Standards Harmonization in Asia and Oceania**, Shilla Hotel, Seoul, South Korea. Contact: Prof. Nam Kim, School of Electrical and Electronics, Chungbuk National University, Geasindong 48, Cheongju, Chungbuk 361-763, South Korea, (82+43) 261 2482, Fax: (82+43) 274 6206, E-mail: <namkim@cbucc.chungbuk.ac.kr>, Web: <www.rapa.or.kr/emf/index.htm>; or Dr. Leeka Kheifets, <kheifetsl@who.int>.

October 29-30: **International Scientific Workshop on Electromagnetic Fields, Mobile Telephony and Health**, Brussels, Belgium. Contact: Peter Wintlev-Jensen, DG Information Society F4, Av. Beaulieu 33, Office BU33 2/80, B-1160 Brussels, Belgium, (32+2) 299-9320, Fax: (32+2) 296-2981, E-mail: <peter.wintlev-jensen@cec.eu.int>.

November 7: **Future Research on Health Effects of Non-Ionizing Radiation in the Environment**, Bern, Switzerland. ABUWAL-sponsored conference. Contact: Felix Heckendorn, Sektion NIS, BUWAL, (41+31) 324-3415, Fax: (41+31) 324-0137, E-mail: <Felix.Heckendorn@buwal.admin.ch>.

November 30: **Electromagnetic Fields and Health: Which Regulatory Framework for the European Community?**, a conference of the Academy of European Law (ERA), Jean Monnet Bldg., Luxembourg. Contact: Uta Ellerhorst, ERA, Metzger Allee 4, D-54295 Trier, Germany, (49+651) 937-3741. Fax: (49+651) 937-3790, E-mail: <Uta.Ellerhorst@era.int>.

December 4-7: **WHO/ICNIRP Conference on EMF Biological Effects & WHO Standards Harmonization for the African Region and WHO RF Research Coordination Meeting**, University of Stellenbosch, Cape Town, South Africa. Contact: Prof. Barney de Villiers, University of Stellenbosch, PO Box 19063, Tygerberg 7505, Cape Town, South Africa, (27+21) 938-9201, Fax: (27+21) 938-9558, E-mail: <bhl@maties.sun.ac.za>.

December 17-19: **Physical Effects of Pulsed RF Fields at Microscopic and Molecular Dimensions (Microdosimetry)**, Akademie für Arbeitssicherheit und Gesundheitsschutz, Dresden, Germany. Contact: Gerd Friedrich, Forschungsgemeinschaft Funk (FGF), Rathausgasse 11a, 53111 Bonn, Germany, (49+228) 726-220, Fax: (49+228) 726-2211, E-mail: <info@fgf.de>, Web: <www.fgf.de>.

especially deal with the possible influence of weak RF fields used in mobile communication," **Gerd Friedrich**, the director of FGF, the research arm of the German mobile phone industry, wrote in his letter of invitation. "An ultimate goal is to predict with confidence the effects of energy absorption from RF fields at the smallest dimensions and join these to microdosimetry at anatomic and histological scales," he stated. The second workshop, *Mechanisms for Interactions of RF Energy with Biological Systems*, was held in Washington, May 22-23 (see *MWN*, M/J01). A report outlining the principal conclusions of the May meeting has been prepared by Drs. Asher Sheppard, Mays Swicord, Sakari Lang and Frank Gollnick and is available on the Internet at <www.mmfa.com/files/research/research.htm>. The first meeting,

which was held in Germany last December, addressed the “portability” of biological data across frequencies and modulations. *Microwave News* published a précis of this workshop in the May/June 2001 issue. Among those invited to the December meeting are: Drs. Ross Adey, Dean Astumian, Frank Barnes, Ferdinando Bersani, S.M. Bezrukov, B. Bianco, Günter Boheim, Yuri Chizmadzhev, Chris Davis, Ken Foster, Günter Fuhr, Jan Gimsa, Roland Glaser, Frank Gollnick, Friedemann Kaiser, Klaus Kramer, Sakari Lang, Damijan Miklavcic, Andrei Pakhomov, Bill Pickard, Earl Prohovsky, Mays Swicord, Jim Weaver and Peter Wust.

- The **SCC-34** subcommittee that is developing the protocol for **measuring SARs** from mobile phones cancelled its September 17-19 meeting in Ottawa due to travel problems following the September 11 terrorist attacks. Most of the draft standard was approved, some with comments, by 80% of those qualified to vote. “There is one last hang-up,” said FDA’s **Howard Bassen**, the subcommittee chair. “We need to complete the section on uncertainty analysis of the measurements and the measurement procedures.” Once that is completed, a meeting will be scheduled.

- The WHO **Temperature Workshop** that is being organized by Motorola’s Dr. **Joe Elder** for October 16-17 in Geneva has been delayed until next March (see *MWN*, J/A01). These travel arrangements were also upset by the September 11 attacks. A second **Thermoregulation Workshop**, organized by Dr. **Eleanor Adair** of Brooks Air Force Base on behalf of ICNIRP and the IEEE, is on hold until after the WHO–Motorola meeting.

- IEEE’s International Committee on Electromagnetic Safety, better known as **SCC-28**, will meet in **Luxembourg**, December 1-2, immediately after the conference being organized by the European Academy of European Law. For more information, check SCC-28’s Web site, <grouper.ieee.org/groups/scc28>. The committee will meet again in San Antonio, January 18-20.

Across the Spectrum

If any group had the White House wired, it was the electricity industry. The director [Thomas Kuhn] of its major lobbying arm, the Edison Electric Institute, roomed at Yale University with George W. Bush. Electricity generators and marketers contributed \$19.7 million to Republicans since 1998, roughly double what they gave Democrats, according to the Center for Responsive Politics.

—**Judy Pasternak**, “**Bush’s Energy Plan Bares Industry Clout**,” *Los Angeles Times*, p.A22, August 27, 2001

In the age of Third World–sponsored terrorism, the E-bomb is the great equalizer.

—**Jim Wilson**, “**E-Bomb: In the Blink of an Eye, Electromagnetic Bombs Could Throw Civilization Back 200 Years. And Terrorists Can Build Them for \$400**,” *Popular Mechanics*, p.53, September 2001 (see also *MWN*, N/D99 and N/D00)

“Hundreds of studies all come to the same conclusion: that there is no link between cancer and mobile telephony.”

—**Mikael Westmark**, spokesperson, Ericsson, Stockholm, quoted by **Allyson Vaughan**, “**Germany Urges Caution in Wireless Use**,” *Wireless Week*, p.13, August 13, 2001 (on August 14, Ericsson posted a number of statements on mobile phones and health on its Web site; go to: <www.ericsson.com/health>)

It is “irresponsible” for operators to suggest in advertisements that youngsters needed a mobile phone to return to school.

—**Sir William Stewart**, former chair, U.K. Independent Expert Group on Mobile Phones, at the **British Association for the Advancement of Science’s** festival of science in Glasgow, Scotland, September 4, quoted by **Robert Uhlig**, “**Mobile Telephones in New Brain Tumor Alert**,” *Daily Telegraph* (U.K.), p.10, September 5, 2001

These days, cell phones are kids’ stuff.

—**Andrea Petersen**, citing a projection by the **Yankee Group**, a consulting firm based in Boston, that phone use in the U.S. among children 13 to 18 years old will soon outstrip that of adults, “**Should Kids Have Cell Phones?**,” *Wall Street Journal*, special report on “**Telecommunications**,” p.R12, September 10, 2001

“MICROWAVE NEWS” FLASHBACK

Years 20 Ago

- Dr. Norman Balabanian, the editor of the IEEE’s *Technology and Society* magazine, criticizes a COMAR draft position paper on human exposures to RF/MW radiation as marred by inconsistencies, logical fallacies and inaccurate implications. COMAR President Dr. Om Gandhi responds that his committee is sticking with it.
- Dr. Gregory Lotz of the Naval Aerospace Research Lab in Pensacola, FL, reports that monkeys exposed to 225 MHz radiation at an SAR of 1.5 W/Kg experienced “much greater heating” than expected. “Something unexplained” is going on, he concludes.

Years 10 Ago

- Henry Kues of JHU’s Applied Physics Lab and FDA’s Jack Monahan find that pulsed 1.25 GHz radiation at an SAR of 3.5-4 W/Kg can damage the cone photoreceptors in the eyes.
- In a letter to IEEE SCC-28 Chair Dr. Tom Budinger, Sue Donald-

son, a member of the Seattle city council, asks how the committee can justify dismissing the existence of health effects below 4 W/Kg.

- The U.S. Congress picks the Department of Energy to lead and coordinate the federal government’s EMF health research program.

Years 5 Ago

- A third epidemiological study links EMFs to female breast cancer. Dr. Patricia Coogan of Boston University sees a 43% increase in breast cancer among women “with a high potential for occupational exposures to magnetic fields.”
- The FAA is urged to impose industry-wide restrictions on the use of electronic devices aboard aircraft. It is the second time in eight years that an advisory committee has issued such a warning.
- The California Supreme Court rules that state courts cannot hear EMF property devaluation lawsuits. They fall within the jurisdiction of the state’s Public Utilities Commission, the court finds.

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Novato, CA 94945 (415) 892-1863.
<www.energyfields.org>**EMP****Trying Again To Protect Telecom Equipment...** On September 25, a lawyer and a computer consultant petitioned the FCC to mandate the protection of civilian electronic equipment against potential disruption by an EMP, or electromagnetic pulse. Don Schellhardt, an attorney based in Waterbury, CT, and Nickolaus Leggett in Reston, VA, filed similar petitions 15 years ago, but the FCC turned them down twice (see *MWN*, S/O86, J/F87 and M/J87). Their new effort was prompted by the September 11 terrorist attacks. When asked by *Microwave News* why the FCC might now grant their request, Leggett pointed to the development of non-nuclear devices that can generate EMPs. Indeed, they appended a copy of the article on "E-Bombs" from the September issue of *Popular Mechanics* (see p.15).**MILITARY RADAR****Compensation for Radiation Exposures...** The German government will compensate military personnel who became ill after working with or near radar equipment. On June 21, Defense Minister Rudolf Scharping announced that claims will be settled in a "prompt, nonbureaucratic" manner. Many current and former soldiers have blamed radar radiation for a variety of health problems, including cancer and cardiac and immunological irregularities. Up to now, their claims have languished because they were unable to prove that radar caused their injuries. The soldiers are also targeting the U.S. manufacturers of the radar systems: General Electric, ITT Industries and Raytheon. Ramo Klinger, a lawyer in Berlin who represents more than 500 former servicemen, said that he will take legal action if the companies are unresponsive, according to Reuters (August 30). The shift in government policy follows an inquiry on the military's use of toxic agents, including asbestos and electromagnetic radiation. A June 21 report by an independent commission, set up by the ministry of defense, concluded that in the 1960s and 1970s some soldiers could have been exposed to x-rays generated by high-power radar equipment. The panel stated that radar radiation was unlikely to have caused any of the illnesses—though it could not rule out such a link. These findings are based largely on the work of Dr. Eduard David of the University of Witten, but his study for the defense ministry remains classified. Others disagree. The report quotes Dr. Günter Käs, a radar engineer formerly on the faculty of the Federal Defense University in Munich, stating that ruling out the role of RF/MW radiation would be "preposterous." The full text of the 128-page report, *The Armed Forces and Their Handling of Hazards and Toxic Substances*, is available in German at: <www.bundeswehr.org/common/images/bild_78.pdf>.**PEOPLE****Dr. Ulf Bergqvist** died suddenly on September 11, a few days after attending the EBFA conference in Helsinki. He was 52. Bergqvist was on the faculty of the Institute of Technology at Sweden's University of Linköping. A protégé of Dr. **Bengt Knave**, Bergqvist became a member of ICNIRP when Knave stepped down (see *MWN*, J/A92). At the EBFA meeting, Bergqvist told *Microwave News* that he was looking forward to the publication of the English edition of his report on *Electromagnetic Sensitiv-*

ity and Health Risks, which was in the process of being translated. Bergqvist had been playing a leading role in setting up COST281, the new effort on the potential health effects of mobile phone technology (see p.6)....Dr. **Boris Pasche** has decided not to join Dr. **Abe Liboff** as coeditor of the reformulated journal *Electromagnetic Biology and Medicine* (see MWN, J/A01). "I plan to bring in a medical doctor with appropriate clinical experience as a coeditor next year," Liboff said....Dr. **Eleanor Adair**, the newly installed chair of SCC-28, is going home to rejoin her husband, physicist Dr. Robert Adair, in New Haven, CT. In mid-October, Adair will leave Brooks Air Force Base in San Antonio where she has been a senior scientist working on electromagnetic radiation effects. She said that she will be a visiting fellow at the John Pierce Lab, where she worked before moving to Texas. ...**Tim Harrington** has joined the equipment authorization branch at the FCC lab in Columbia, MD, where he will review SAR data submitted by cell phone manufacturers. The objective is to free up time for **Kwok Chan** to do SAR testing with the lab's two new measurement systems. Previously, Harrington worked at All-gon Telecom in Fort Worth, TX, where he was an engineer in the handset antenna group.

PEST CONTROL

Zapping Zebra Mussels...EMFs could be used to control infestations of zebra mussels, according to Drs. Matthew Ryan of Purdue University Calumet in Hammond, IN, and Cliff Chancey of the University of Northern Iowa, Cedar Falls. In a paper presented on August 28 at a meeting of the American Chemical Society in Chicago, Ryan reported that, in their lab, mussels exposed continuously to 60Hz magnetic fields at levels up to 100 G were all dead after 40 days, compared to only 10% of the control mussels. Other aquatic species suffered less harm or none at all. In an interview, Chancey suggested that the fields kill the bivalves by interfering with the way they filter calcium ions from water. The lima-bean-size mollusks cause extensive damage to ecosystems, ships and underwater pipes in the Great Lakes. While chemicals can also control them, they cause some serious side effects. Asked if the EMF system would be safe to use in the lakes, Chancey replied: "Why would I want to swim next to the intake pipe for a power plant?" Ryan and Chancey, who have a patent application pending, have received many inquiries from potential users since the Chicago meeting.

SOLAR POWER SATELLITES

NAS-NRC Progress Report...Space Solar Power (SSP) might make a comeback. The possibility of collecting solar energy with satellites and beaming it down to Earth with microwaves is addressed in an NAS-NRC report released on September 24. An eight-member panel chaired by Dr. Richard Schwartz of Purdue University in West Lafayette, IN, concludes that the human health effects of the system's microwave power beam "must be quantified before public acceptance is found." The panel warns that, "Little research has been performed at field levels specific to SSP," and predicts that the SSP program "may well be subject to the same sort of public relations requirements" as the wireless industry, where "public perception is driving cell phone manufacturers to change their designs even without clear scientific

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evidence.” The energy will be beamed to Earth at 5.8GHz. The power level is expected to be less than 1 mW/cm² outside the receiving antenna’s protective fence. *Laying the Foundation for Space Solar Power: An Assessment of NASA’s Space Solar Power Investment Strategy* is available free at <www.nap.edu>. A paperback copy is available for \$22.60 at the same Web site.

WEAPONS DETECTION

Pulsed Technology...Scientific Applications & Research Associates in Huntington Beach, CA, will market a new generation of security systems that can distinguish weapons from other metallic objects as well as pinpoint where on a person they are hidden. The technology, which was developed in 1995 by the USAF’s Directed Energy Directorate at Kirtland AFB, NM, can be incorporated in current walk-through archway systems. Dean Lawry, an engineer with the directorate’s high-power microwave division, explained that pulsed radiation sets up eddy currents within metal objects, which then send signals to an antenna array. Radiation exposures are similar to those from security archways currently used in airports, according to Lawry. “We don’t need very much power,” he told *Microwave News*.

AS WE GO TO PRESS

WHO Clarification...On October 10, as *Microwave News* was on its way to the printer, the WHO issued a press advisory denouncing press reports that it “insists mobile phone emissions are safe” (see, for example, the controversy in Singapore, p.8). The WHO called such a statement a “distortion,” and stated that it stands by its position spelled out in its fact sheet last year (No. 193)—that there are gaps in knowledge that ongoing research should clarify over the next 3-4 years (see *MWN*, J/A00).

Keeping Current: Follow-Up on the News

◆ AT&T Wireless is offering each of its customers a hands-free kit at no charge. In a September 27 press release, the company touted the fact that it is the first U.S. company to do so. A number of class-action lawsuits, which are still pending, are seeking free headsets for all users of mobile phones (see *MWN*, M/J01).

◆ Ken Gettman of the National Electrical Manufacturers Association (NEMA) in Washington spoke against a motion to post biographies and pictures of members on the SCC-28 subcommittee Web site at the panel’s June 9 meeting in St. Paul. He cited concerns that having such information on a publicly accessible site would be a “security issue.” The motion was later approved.

◆ Pekka Ala-Pietilä, the president of Nokia, has been fined more than \$30,000 for running a red light in central Helsinki. The fine is based on his annual salary of approximately \$4 million.

◆ Radiation from a communications antenna under construction at a British military base in Cyprus will pose no health risks, the governments of Cyprus and the U.K. stated on August 28. A measurement survey by local government officials, with the assistance of France Telecom, showed that public exposures are “at least 76 times lower than the [ICNIRP] limit,” according to the

statement and that the new antenna is “not expected to show a considerable increase in the levels of electromagnetic emissions.” Rioting erupted in July after the arrest of a Cypriot elected official who was protesting the towers (see *MWN*, J/A01).

◆ Ancona on the Adriatic coast will be Italy’s first city to bury all its power lines, according to *Italy Daily* (October 5), published by *Corriere della Sera*. An accord was reached between city officials and ENEL, the power company, to address public concerns over aesthetics and EMFs.

◆ In what some might describe as a major scientific breakthrough, Aulterra International, based in Coeur d’Alene, ID, has “confirmed” that its Neutralizer product “is 100% effective in eliminating the harmful effects” of ELF and RF EMFs from cell phones and most other electronic devices. The half-dollar-size disk, made of a “proprietary organic compound composed of natural earth elements,” is easy to install—you simply stick it on any surface of your mobile phone. If you are wondering how it works, Dr. Glen Rein of Quantum Biology Research Labs in Northport, NY, and formerly a member of Dr. Art Pilla’s lab, offers his ideas on Aulterra’s Web site, <www.Aulterra.com>. The Neutralizer costs only \$24.00, or you can get three for \$60.00.

VIEWS ON THE NEWS

Why Not Precautionary Limits? (No, We Are Not Antiscience)

We welcome WHO's adoption of prudent avoidance (see p.1). It's about time.

The WHO EMF project had little choice after IARC classified EMFs as possible human carcinogens in June. The NIEHS working group designated EMFs possible cancer agents in 1998 and the U.S. EPA did so in 1990. The WHO project could have opted for prudent avoidance years ago.

At the same time as WHO's Dr. Michael Repacholi is finally advocating taking low-cost measures to limit exposures, he continues to adamantly oppose health standards based on the precautionary principle. His reason is that such a move would be antiscience.

At the EBEA meeting, Repacholi dismissed the idea of tighter exposure standards as "undermining hundreds of millions of dollars of research for no apparent health benefit." He was equally critical of the Swiss and Italian precautionary RF/MW standards. "Italy brought in their own limits and forgot the science," Repacholi told the press in Helsinki. "The lower the limits, the greater the public concern," he warned, based on some curious logic of his own (see p.3).

Italy's Dr. Paolo Vecchia shares these views. In his presentation, he said that the consequences of the Italian 6 V/m standard are to increase public fears and to "undermine science."

We are not antiscience—nor are we against motherhood and apple pie. But we also believe in public health. In the face of a possible 4 mG cancer risk, blind allegiance to ICNIRP's 1,000 mG standard puts public health in the backseat behind economic interests.

Vecchia concedes that the ICNIRP standard does not offer any protection against cancer risks. "No one ever thought that ICNIRP's limit is justified for long-term effects," he said in Helsinki. That prompted Dr. Norbert Leitgeb of Austria's Graz University to respond that the 1,000 mG standard presents "a very large problem in risk communication."

Leitgeb is on to something. One sure way of being antiscience is to misrepresent the facts. People are not stupid—they are quick to realize when they are being sold out. After that, they will not believe anything and science *has* been devalued.

If the citizens of Zurich, Rome or Salzburg want strict standards for mobile phone towers, let them have them. There are enough uncertainties in the scientific data to allow for a precautionary approach. Yes, such limits will make their phone service

more expensive. But if they decide that the price is too high, they can always opt for looser limits. That is *their* choice.

Setting standards is as much a social as a scientific exercise. It is about dealing with uncertainty and deciding on acceptable levels of risk. Scientists can offer advice, but they should not get indignant if their views don't prevail.

We expect the power and phone companies to argue for looser standards; they are trying to make money for their shareholders. But if the scientific community also worries about corporate profits, who then will argue for public health?

NCRP Should Reinstate Its RF/MW Standards Committee

The directors of the NCRP made a grave mistake when they closed down Dr. Jim Lin's committee on RF/MW health effects and exposure guidelines (see p.11).

Lin was only months away from finishing his draft report, yet no one consulted him or the members of his committee or the 85 members of the council before deciding to junk six years of work. Indeed, Lin was seen as so insignificant that no one bothered to tell him of the board's decision for six weeks.

Lin's committee, No.89-5, was the victim of a military-industrial coup orchestrated by IEEE's SCC-28 committee.

Ron Petersen, the NCRP vice-president in charge of non-ionizing radiation and a former staff member of Lucent Technologies, and Dr. C.K. Chou, an original member of Lin's committee, also have leading positions within SCC-28. They played a major part in the demise of NCRP 89-5.

Five years ago, both showed their true loyalties when, accompanied by executives from the cellular phone industry, they lobbied the FCC against adopting the NCRP exposure standard. They urged the commission to favor the IEEE limits. SCC-28 has long had designs on becoming the preeminent standards group and is now one step closer to fulfilling this ambition. Only ICNIRP stands in its way.

In January 2000, two years after he joined Motorola, Chou finally conceded the obvious: He had a conflict of interest. When Chou put this in writing, Lin felt he had no choice but to ask him to resign. Work on the report stopped while Chou resisted leaving the committee and Petersen refused to force the issue.

Having put roadblocks in Lin's path for 18 months, Petersen closed down his committee on the pretext that it was working too slowly. With the NCRP committee out of the picture, Chou will soon unveil his own major relaxation of the RF/MW exposure standard (see p.1).

If Chou succeeds in getting the standard approved, Motorola should make him employee of the month. He will have helped win acceptance of a standard that allows the radiation delivered to the user of a cell phone to increase by more than tenfold—a level so high that it would make compliance testing of phones a mere formality.

Are Dr. Charles Meinhold, the NCRP president, and the rest of the NCRP board aware of these blatant conflicts of interest? If they aren't, they ought to be.

We urge the NCRP to put its house in order.

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