TENFORDE TO RECEIVE THE 2000 D’ARSONVAL AWARD

by Larry Anderson and Janet Lathrop

Thomas S. Tenforde, senior chief scientist in the environmental technology division, Pacific Northwest National Laboratory, Richland, Wash., will receive the eighth d’Arsonval Award, presented by the Bioelectromagnetics Society to recognize “extraordinary accomplishment within the discipline of bioelectromagnetics.” This award recognizes Tenforde’s extensive research on dosimetry and biophysical interaction of static and low-frequency electric and magnetic fields with living systems.

Tenforde was president of the Bioelectromagnetics Society in 1987-1988. The d’Arsonval Award will be presented to Tenforde by current BEMS President Frank Barnes on Monday, June 11 during an awards luncheon from 12:15 to 1:45 in the Minnesota East Ballroom at the St. Paul Radisson Riverfront Hotel. Tenforde’s talk for the occasion is titled “The Wonders of Magnetism.”

Educated at Harvard University and the University of California at Berkeley, Tenforde’s strong interest in bioelectromagnetics began with the use of static electric fields for single-cell microelectrophoresis during his doctoral thesis work. In the 1970s and 1980s at Lawrence Berkeley National Laboratory he conducted a broad range of biological studies on static and ELF magnetic fields. Tom and his colleagues at the Donner Laboratory at the University of California developed what soon became the foremost program investigating the biological effects of strong static magnetic fields. These studies looked at the cardiovascular system, the nervous system, thermoregulation, circadian rhythmicity, lipid bilayer membrane permeability, and animal behavior.

This work initially began because of concerns about human exposure to strong magnetic fields near thermonuclear fusion reactors, magneto-hydrodynamic power systems, and high-energy physics facilities such as cyclotrons and bubble chambers. Tom and his colleagues played a key role in the evaluation of potential risks to patients and workers from MRI facilities. They helped to demonstrate the safety of magnetic resonance imaging (MRI) systems, and aided the establishment of occupational and public exposure guidelines for exposure to static magnetic fields by the American Conference of Governmental Industrial Hygienists and the International Commission on Nonionizing Radiation Protection.

In the early 1980s, Tom led research in the development of a small computerized exposure meter for recording static magnetic fields that could be worn during a normal work day. Subsequently this meter was modified for EPRI to measure small ELF magnetic fields. It was the first of what has become a series of smaller and more capable meters developed for electromagnetic field exposure measurements. In our age of microminiature electronics

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and computers this has become routine, but in the early 1980s it was truly a formidable undertaking.

In 1987, Tom became a senior chief scientist in the health division at the Pacific Northwest National Lab. He has been at the center in the development of NMR spectrometer systems, including the world’s highest frequency (900 MHz) analytical NMR spectrometer for the study of large macromolecular structures. This is important because many biological molecules of interest are too large to be satisfactorily studied in aqueous solution with existing NMR systems operating at lower frequencies.

As manager of PNNL’s Hanford Radioisotopes Program, Tenforde supervised work which produced the medical isotope yttrium-90, which is now being used worldwide to treat cancer and recently won an award as one of the 23 most important new technologies developed with financial support from DOE. By 1999, yttrium-90 production and sales were privatized and the accomplishment won a Federal Laboratory Consortium Award.

Tenforde is well known among his peers, having served on more than 30 national and international committees and boards, contributed to as a reviewer to scores of agency reviews and journals, and for his national and international standards-related work on public and occupational exposure to ionizing and nonionizing radiation. He is a member of the American Association for the Advancement of Science, the New York Academy of Sciences, the American Conference of Governmental Industrial Hygienists, the Radiation Research Society and the Society of Nuclear Medicine.

Tom has benefited greatly throughout his career from the encouragement of his wife, Susan, and his sons Adam and Mark.

### PROCEEDINGS AVAILABLE FROM ST. PETERSBURG INTERNATIONAL WORKSHOP

The Swedish National Institute for Working Life has published a series of papers from a workshop in St. Petersburg, Russia, from October 17-20, 2000 on “clinical and physiological investigations of people highly exposed to electromagnetic fields.” The conference was sponsored by NIWL, Russian Institute of Human Brain, St. Petersburg, and the Bioelectromagnetics Society.

Kjell Hansson Mild and Monica Sandström, NIWL, Umeå, edited the 58-page paper, which covers possible effects of exposure in the extremely-low-frequency (ELF) to microwave and radio-frequency ranges.

“Proceedings from the International Workshop—Clinical and Physiological Investigations of People Highly Exposed to Electromagnetic Fields,” is available on the Web at: www.niwl.se/ arb/2001.html or by contacting Mild at the National Institute for Working Life, Box 7654, S-907 13 Umeå, Sweden; Phone +46 90 176017; FAX +46 90 176117.

### D’ARSONVAL’S LEGACY

Arsène Jacques d’Arsonval was a gifted physician, biologist, physiologist and physicist born in France in 1851, whose theoretical and experimental research objectives often led to development of refined instruments and inventions which became important in biological sciences and medicine. This extension of laboratory tools to industrial use was exemplified by d’Arsonval’s work on metabolism, according to Don Justesen and Arthur Guy, in a 1985 profile in Bioelectromagnetics.

d’Arsonval’s studies of the difference between body temperature and body metabolism led ultimately to inventions such as the calorimeter, thermostat, thermogalvanometers for measuring blood gases and liquids, cell-culturing apparatus, and devices such as the double-walled bottle (now known as a thermos) for lowering the temperature of cell suspensions in the laboratory using liquid air.

d’Arsonval’s research on electrophysiological activity in muscles and nerves led him to explore the effects of low- and high-frequency currents, which in turn led to his designing radio-frequency generators and applicators for medical use known as diathermy, Justesen and Guy note.

He was the first physician to use field-induced hyperthermia to treat cancer, and one of his generators was taken to Paris and used as the source of the first wireless transmission from the Eiffel Tower. Many other instruments devised by d’Arsonval—mobile galvanometers, voltmeters, ammeters, thermoelectric appliances, telephones, myophones and more—remain in common use in physics and biology laboratories today and have found their way to physiology laboratories, medical clinics and to industry, as well, they add.

Further, d’Arsonval “might well be credited as a founder of industrial medicine,” say Justesen and Guy, for he invented an electric chronometer to measure the speed of nerve conduction and duration of excitability of muscles and nerve cells after the death of experimental animals, which led to studies of the mechanism of death after electrocution of industrial workers. His work on mammalian pulmonary respiration and lung function was notable, as well.

“Members of the Bioelectromagnetics Society can take great pride in the namesake of its most prestigious award,” wrote Guy and Justesen. “He is the the patron scientific saint of all investigators of every nation that labor at the intersections of electromagnetic waves, biological systems, and medical applications.”

Previous d’Arsonval Award winners are Nancy Wertheimer, Om P. Gandhi, C.H. Durney, W. Ross Adey, C.A. L. Bassett, Arthur Guy and Herman P. Schwan.
LATE ITEMS FOR THE ANNUAL MEETING PROGRAM

• IEEE SCC-34 Subcommittee 2, Wednesday, June 6 and Thursday, June 7 from 8:30 a.m. to 6 p.m. in Governor’s Room II & III. Contact Richard A. Tell (702) 645-3338 or Howard Bassen (301) 827-4950; E-mail: hib@cdrh.fda.gov

• IEEE SCC-34 Main Committee Meeting, Thursday June 7, 7 to 10 p.m., in Governor’s Room II & III. For more information, contact Ron C. Petersen, Manager, Wireless and Optical Technologies Safety Department, Lucent Technologies/Bell Labs, Room 1E231, 600 Mountain Avenue, Murray Hill, NJ 07974-0636. Phone: (908) 582 6442; Fax: (908) 582 6693. Email: rc.petersen@lucent.com

• An Open Discussion of RF Exposure Systems for Animal Toxicology and Carcinogenicity Studies, sponsored by the National Toxicology Program, Wednesday, June 13, 7:30 - 9:00 p.m. in Great River I. Moderator will be Christopher Portier, acting associate director, U.S. National Toxicology Program. Speakers include John Ladbury, U.S. National Institute of Standards and Technology, on “RF Exposure Systems for Biomagnetic Experiments in Rodents at Telephone Frequencies”; Niels Kuster, Swiss Foundation for Research on Information Technologies in Society; “Comments and Discussion: Dosimetry of RF Exposure”; Speaker To Be Announced for “Practical Aspects of Conducting Toxicology Experiments with Different RF Exposure Systems.” Panel discussions, with comments on “Dosimetry of RF Exposures” will be held, as well. Audience participation is encouraged.

• Forum Mobilkommunikation (FMK), a non-profit industry association in Austria sponsors a Science Helpdesk on the Web for industry spokespersons, health and research institutes and other subscribers, helping them to stay informed about research on mobile phones and health. Sheila A. Johnston, neuroscience consultant, London, and FMK Director Romana Steidl, Vienna, maintain the non-profit Website, which is password-protected. Several well known scientific publishers permit use of their abstracts in return for copyright acknowledgement and web address notices. Scientists update the site with new papers as well at: www.sciencefaqs.com See Poster 140 for more details.

EU COST PROGRAM TO SUPPORT MOBILE RESEARCH

Scientists in European Union member nations are expected to begin a series of joint studies supported in part by the European Union’s Cooperation on Scientific and Technical research program, or COST. Although COST does not fund the research, it facilitates cooperation between research institutions and makes recommendations to appropriate EU committees in Brussels. One of these recently designated nine new projects to begin in July 2001, according to the London Times.

The projects will include research on:

• Channel Modelling and Propagation Impairment Mitigation for Millimetre-Wave Radio Systems — improving the design and planning of broadband telecommunications systems

• Electromagnetic Fields and Health: Emerging Information and Communication Technologies — gaining “a better understanding of possible health impacts of emerging technologies, especially related to communication and information technologies, that may result in exposure to electromagnetic fields.”

• Applied Biocatalysis: Stereoselective and Environmentally Friendly Reaction Catalysed by Enzymes

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NEWS IN BRIEF

AUSTRALIAN SENATE COMMITTEE REPORTS TO PARLIAMENT

An Australian Senate Committee completed its inquiry on health effects of “electromagnetic radiation” and issued a three-part report in Canberra on May 4.

Committee chair Lyn Allison called for an approximately 10-fold increase in EMF-RF health effects research in Australia, to be funded through a $5 annual fee collected for each mobile phone in use, the fee to be reviewed every five years.

Allison’s plan would allow the National Health and Medical Research Council (NHMRC) to continue administering an annual research program of about $4 million, but it would ask the Commonwealth Scientific and Industrial Research Organization (CSIRO) to start a dedicated program of about $36 million to support RF health effects studies.

Allison, of the Democrat Party, and members made a total of 13 recommendations. They include:

Recommendation 2.1

“The committee chair recommends that, particularly in light of recent reports on the links between powerlines, radio towers and leukaemia, additional research into extremely low frequencies and TV/radio tower exposure should be encouraged.”

Recommendation 2.2

“The committee Chair recommends that precautionary measures for the placement of powerlines be up-graded to include wide buffer zones, and undergrounding and shielding cables where practicable.”

Recommendation 2.3

“The Committee recommends that based on a growing body of research that provides evidence of biological effects, the Commonwealth Government considers developing material to advise parents and children of the potential risks associated with mobile phone use.”

Recommendation 2.4

“The Committee recommends that shielding and hands-free devices are tested, labeled for their effectiveness and regulated by standards.”

Recommendation 2.5

“The Committee Chair recommends that the Government review the Telecommunications (Low-impact Facilities) Determination of 1997, and as a precautionary measure, amend it to enable community groups to have greater input into the siting of antenna towers and require their installation to go through normal local government planning processes.”

Recommendation 2.6

“The Committee recommends the development of an industry code of practice for handling consumer health complaints.”

Recommendation 2.7

“The Committee recommends the establishment of a centralized complaints mechanism in the Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) or the Department of Health for people to report adverse health effects associated with mobile phone use and other radiofrequency technology, and for the data from this register to be considered by NHMRC in determining research funding priorities.”

Six other recommendations, one by the full committee and five only from the chair, Allison, suggest that the Australian government sponsor conferences on RF health effects, study p53 mice, define and administer an RF standard “by a process similar to that used by Standards Australia,” and that Australia’s expired Interim Standard (AS/NZS 2772.1(Int):1998) of 200 microWatts per square centimeter be retained in the Australian Standard.

Dissenting Liberal and Labour Party members of the senate committee objected, however, to what they termed an “enormous” increase in research funding, from AUS$4.5 million to AUS$40 million, recommended by Allison.

In their “Critique of the Chair’s Report,” Labor Party senators on the committee express support for ongoing research, but point out that “some recommendations and evidence are outside the terms of reference of the Inquiry.... some recommendations and conclusions are nonsensical and unfounded in the light of the evidence.... certain evidence has been given undue weight notwithstanding dubious credibility of witnesses.... evidence has been distorted or taken out of context.”

Full text of the Australian Senate report including the two dissenting reports are available in a series of pdf files on the Web at: www.aph.gov.au/senate_environment

U.K. ADVISORY GROUP ON NIR UPDATES REPORT

The U.K. National Radiological Protection Board’s (NRPB) Advisory Group on Non-ionising Radiation (AGNIR) released its report on power-frequency electromagnetic fields and the risk of cancer at a press conference in Chilton on March 6.

AGNIR’s main conclusion, as quoted by the NRPB:

“Laboratory experiments have provided no good evidence that extremely low frequency electromagnetic fields are capable of producing cancer, nor do human epidemiological studies suggest that they cause cancer in general. There is, however, some epidemiological evidence that prolonged exposure to higher levels of power frequency magnetic fields is associated with a small risk of leukaemia in children. In practice, such levels of exposure are seldom encountered by the general public in the UK. In the absence of clear evidence of a carcinogenic effect in adults, or of a plausible explanation continued on page 7
BEMS WORKSHOP: NEW DATA ON ELF AND RF MECHANISMS

by Asher Sheppard

Nine speakers, including past-presidents James Lin, Larry Anderson and Kenneth McLeod, as well as current President Frank Barnes, were featured at the workshop “Electromagnetic Fields Interactions with Living Matter,” on Feb. 9, 2001 in Washington, D.C. The meeting, sponsored by BEMS and attended by 40 people this year, provides scientists, government officials, industry representatives, and the public an opportunity to learn current happenings in bioelectromagnetics directly from active scientists. It has become an annual event coinciding with the Board of Directors’ meeting.

Secretary Ewa Czerska, speaking on behalf of herself and co-organizer Lee Rosen, made introductory remarks followed by a presentation from Frank Barnes, who discussed RF mechanisms from both biophysical and chemical perspectives. Barnes noted that electromagnetic coupling often introduces non-uniform patterns of energy deposition, and comparisons between thermal time constants and pulse durations are important because of the rapid thermalization of heat in biological tissue. Modulation-dependent effects may occur for cases in which amplitude modulation produces short-lived temperature pulses. Experimental evidence also suggests that periodic forcing functions, such as those from a regular pulse train, might influence biochemical systems differently than continuous energy input. A lively question period followed, during which Barnes remarked that because the scientific and public policy issues surrounding technological uses of electromagnetic energy are so complex, questions will persist.

James Lin then spoke about ELF and RF field coupling in biological tissues and how the frequency dependence of polar materials and bound particles determined the nature of biophysical effects. Lin emphasized the broad usefulness of specific absorption rate (SAR) for quantification of RF energy absorption and the role which eddy currents can play in producing complex spatial field patterns in biological cells and tissues.

The meeting next turned to ELF mechanisms at the cell surface with Kenneth McLeod’s talk. He began with the observation that the lack of mechanistic understanding for low-level effects was an obstacle to our understanding of fundamental biological processes such as development, repair, and adaptation — as well as posing an obstacle to gaining a firmer grasp on the uses of exogenous fields in various therapies. Motivated by the observation that intracellular ELF fields are strongly attenuated, recent work in McLeod’s laboratory has focused on the influence of fields on the extracellular matrix. This has led to findings of long-lasting effects of weak fields on phenotypic expression. Experiments with polysulfonated fibronectin coated onto silicon wafers probes the highly non-linear process of protein self-organization and its dependence on substrate charge density. McLeod explained how this work has led to exploration of a potential relationship between ferrous ion levels in drinking water and breast cancer incidence.

Before discussing several animal studies of cancer and EMF, Larry Anderson pointed out that a past emphasis on cancer research has diverted attention from other research areas which could well be important for public health. The present status of animal research depends on data from experiments on spontaneous tumor formation, initiation-promotion models, evaluating co-carcinogenesis, and studies of the growth of transplanted tumor cells. Questioners showed particular interest in divergent results from similar studies of mammary cancer in rats conducted in Hannover, Germany, by Wolfgang Löscher and colleagues, and at Pacific Northwest National Laboratory by Anderson and colleagues. Potential factors — discussed in detail in a collaborative 2000 paper in “Environmental Health Perspectives” by researchers at the two laboratories — include differences in static and alternating fields, rat strains, and dose of the tumor initiator.

Antonio Sastre discussed effects of magnetic field exposure on heart rate variability. He explained that in the Framingham health study a reduction of one standard deviation in heart rate variability was associated with a 44 percent increase in mortality and morbidity, suggesting that a magnetic field effect on variability of comparable size would be a significant risk factor. This suggests a link to findings of higher mortality in a study of cardiac death among electrical utility workers. The most recent research on human beings indicated that subject arousal attending nighttime blood draws was a necessary concomitant factor with magnetic field exposure and that effects were gender-dependent. Sastre concluded with speculation — based on calculation — that interaction sites in the brain cortex appear likely, but not those in deep-lying brain structures, the heart itself, or its innervation.

Next, Ruggero Cadossi reported finding that pulsed magnetic fields stimulated proliferation of chondrocytes isolated from human tissues only if cells were grown in the presence of fetal calf serum. Specific factors such as the interleukin family and the growth factor TGF-b were tested, but none proved effective as a co-agent for expression of magnetic field effects.

The attention on magnetic fields took another turn with Stefan Engström’s presentation of the evidence and physical rationale for placing relatively greater importance on magnetic field gradients compared to magnetic field amplitudes.

Next, Frank Prato discussed his experiments on human subjects’ ability to maintain postural balance — a marker he and his colleagues have developed in a new protocol for evaluating neurophysiological effects of magnetic fields in humans. In a preliminary report published this year in Neuroscience Letters, Prato and colleagues reported that a pulsed ELF magnetic field

“A past emphasis on cancer research has diverted attention from other research areas which could well be important for public health.”

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NEW BOOKS OFFER RESEARCH SUMMARIES AND RISK COMMUNICATION

Two new books have recently been published on biological and health effects of EMF — one in English, one in French.


In Japan, editors Hiraku Takebe, Takeshi Shiga, Masamichi Kato and Eisuke Masada brought out a substantial 368-page hardcover entitled “Biological and Health Effects from Exposure to Power-line Frequency Electromagnetic Fields. Confirmation of Absence of Any Effects at Environmental Field Strengths,” at about the same time.

The French handbook, by Annette Duchêne and Jacques Joussot-Dubien, is intended for the general public and begins with the basics of the electromagnetic spectrum. The authors discuss what is known about the biological effects of ultraviolet, visible light, infrared, laser, radio-frequency, power-frequency 50/60-Hz electric and magnetic fields, static fields and ultrasound, and summarize exposure limits established by international agencies.


Part I summarizes the authors’ own EMF research as well as related studies by others. Tokyo Electric Power Company’s (TEPCO) multi-year research program to explore possible biological and human health effects from exposure to power-frequency electric and magnetic fields, emphasizing possible cancer-related EMF effects and the search for a potential mechanism. Part II summarizes EMF toxicology studies supported by TEPCO, mainly at the Mitsubishi Chemical Safety Institute, Ibaraki. References and an index are included, along with many graphs, diagrams, tables and photographs.

Takebe and colleagues explain in the preface to this new translation that “Soon after TEPCO started this research program, the U.S. EMF RAPID Program got underway in the United States. “Research plans in the EMF RAPID program overlapped considerably with our research plans,” the authors note, “and much of our research was carried out in parallel with the EMF RAPID program. Our experiments were comparable to most of those in the EMF RAPID program in planning, size, manpower and budget, and we often corresponded with researchers in the EMF RAPID Program to exchange ideas and information concerning issues such as choice of biological endpoints and methodology.”

Like the RAPID Program, the Japanese research effort was designed to pay special attention to “negative studies,” because as the authors explain, “negative data often are difficult to publish in scientific journals.” The new book is also important because results of so few Japanese studies have been available in English. “The editors of this book believe that the research in this book should be widely circulated to the international scientific community,” say Takebe and colleagues, since “the work is both comprehensive and conducted according to the highest scientific standards.”

Their overall conclusion: “Based on the experimental studies compiled in this book, we conclude that there is no evidence to indicate that the EMF found in the environment in Japan are harmful to health.”


The Japanese volume published by Ohmsha, Ltd., Tokyo, is available in the USA and Canada from IOS Press, Inc., Burke, Va., FAX +1 703 323-3668; in the UK and Ireland from IOS Press, Inc., Headington, Oxford, England, FAX +44 1865 75 0079; in Germany, Austria and Switzerland from IOS Press/LSL.de Leipzig, Germany, FAX +49 341 995 4255; in Japan from Ohmsha, Ltd. Tokyo, FAX: +81 3 3293 6224, and in the Netherlands and the rest of the world from IOS Press, Amsterdam, FAX: +31 20 620 3419.

EU COST Program continued from page 3

• Integrative Computational Chemistry — increasing the power and scope of computational chemistry for the European chemical research community

In addition to telecommunications and information technology, other research will focus on surveillance of food-borne animal illnesses such as foot-and-mouth disease, molecular breeding for crop improvement, modelling plant-soil interactions, pollution indicators in groundwater, and the environmental impact of transportation projects.

As noted, COST’s Committee of Senior Officials (CSO) help European universities and institutes to design and coordinate joint research projects. The CSO also helps to organize scientific exchanges and arranges for research publication. Core research costs are usually met by national budgets. The CSO also reportedly agreed to support some studies by non-EU research groups, at the University of Illinois and the University of Texas-Dallas, the Russian Academy of Science and Ukraine Academy of Science, and Concordia University in Montréal, Canada.

Bioelectromagnetics Society members may learn more about COST’s goals and process from BEMS member Ulf Bergqvist, Department of Industrial Ergonomics, University of Linkoping, Linkoping S-58183, SWEDEN. Phone +46 13 28 2573; FAX: +46 13 28 25 79. E-mail: ulber@ikp.liu.se
affected the vestibular system. In their experiment, subjects stood on a platform while undergoing whole body exposure to a 200-µT, 60-Hz pulsed ELF magnetic field. Force transducers attached to the platform determined the steadiness of their balance. Magnetic field exposure had no effect on balance in subjects with their eyes open in a well-lit room, but a significant effect was observed when the eyes were closed or light levels were reduced.

The final paper of the day was given by Andrea DiCarlo of the Vitreous State Laboratory at Catholic University of America, Washington, D.C. She and laboratory director Ted Litovitz devised experiments to test the hypothesis that ELF signals may displace the counterion layer surrounding the cell plasma membrane. Litovitz also wanted to know if counterion displacements caused by vibration would have the same effect. The two stressed chick embryos by hypoxia or exposure to ultraviolet light and measured the survival rate. Among embryos exposed to a 60-Hz magnetic field or 60-Hz mechanical vibrations (9.8 m/s²), survival was enhanced to about the same extent (~60 %) for exposure to either an 8-µT magnetic field or 60-Hz vibration. As was true for earlier research with ELF magnetic fields and ELF-modulated RF fields published in Bioelectromagnetics and elsewhere, both magnetic field and vibration effects depended on the flock that produced the eggs as well as a “coherence time” of the order of 10 s. Survival enhancements were lost when noise was added to the waveform of the applied field or vibration, DiCarlo reported.

from experiments on animals or isolated cells, the epidemiological evidence is currently not strong enough to justify a firm conclusion that such fields cause leukaemia in children. Unless, however, further research indicates that the finding is due to chance or some currently unrecognised artefact, the possibility remains that intense and prolonged exposures to magnetic fields can increase the risk of leukaemia in children.”

An NRPB press release, along with an executive summary and major conclusions of the 173-page AGNIR report may be viewed at the NRPB Web site: www.nrpb.org.uk

The full AGNIR report may be obtained from the NRPB information office, which accepts major credit cards. Phone +44 1235 82 2742; FAX +44 1 235 822 746 or e-mail: information@nrpb.org.uk

U.K. AGNIR Report continued from page 4

An Official Call for Papers will be mailed this month. Submission deadline is in early August. If you have any questions about the submission process or abstract preparation, please do not hesitate to contact one of the following people.

Mary Capelli-Schellpfeffer: capschell@capschell.com
Program Director Michael Cho: mcho@tigger.cc.uic.edu
Executive Director Gloria Parsley: Gloriaparsley@aol.com

Our goal is to have a successful and enjoyable scientific gathering. To this end, Ms. Parsley has organized a hotel with a lovely European elegance in the heart of downtown San Diego. We will be near restaurants, shopping at Horton Plaza, Sea World, and the waterfront. Complimentary hotel transportation is provided to and from the airport only 10 minutes away. If you are able to bring a friend or family members with you to the conference, there will be plenty for them to see and do during meeting times.

We are looking forward to a dynamic and rewarding time together in January 2002. As meeting planning proceeds, please feel free to e-mail me suggestions or comments. See you in San Diego!

Sincerely,
Mary Capelli-Schellpfeffer, MD, MPA
CapSchell, Inc.
1700 East 56th Street, #1405
Chicago, IL 60637
FROM THE JOURNAL EDITOR IN CHIEF

by Ben Greenebaum

Bioelectromagnetics has recently named a new associate editor and made several changes to its Editorial Board. Rene de Seze was named an associate editor by the Board of Directors at its February meeting, after nomination by the European Bio Electromagnetics Association. He replaces Jukka Juutilainen, who resigned after many years of highly-appreciated service because of the press of other duties. Dr. Juutilainen remains on the Editorial Board. Dr. de Seze, like the other Associate Editors, will act as a generalist, but he brings special expertise on the biomedical aspects of exposures at both low and high frequencies.

Rene received his MD in 1985 on Magnetic Resonance Imaging and his PhD in "Sciences de la Vie" in 1991 from the University of Bordeaux II, France. After some years at the Radiology Department and the Medical School of Nimes, University of Montpellier 1, he has recently joined the Toxicology Laboratory of the French National Institute for Industrial Environment and Risks (INERIS), located near Paris. He has published about 15 papers and presented more than 70 meeting communications in various areas of EMF research, including therapeutics, exposure systems, and (mainly) biological effects, particularly in human volunteers. His research has focused in recent years on the health effects of radio-cellular phone microwaves. He served as member or secretary of some national (SFRP), European (EBEA) and international (BEMS) organisations which are working on bioelectromagnetics. He has served on the ICNIRP Subcommittee II (Biology) since May 2000.

Authors and others may contact or send manuscripts to Dr. de Seze at: Dr. Rene de SEZE, INERIS, DRC - Toxicologie Parc ALATA - BP 2, 60550 Verneuil-en-Halatte FRANCE. Phone +33 3 44 55 65 94; Fax: +33 3 44 55 66 05

Other changes in the Editorial Board adopted at the February Board meeting include acknowledgment, with appreciation for their fine service, the resignations or term expiration of Mays Swicord, Sheila Galt and Jan Walleczek.

HAVE YOU HEARD THE CHAT?

Compiled by Ben Greenebaum, Editor in Chief, Bioelectromagnetics

There has recently been a vigorous exchange of e-mail messages in the on-line Bioelectromagnetics discussion group, prompted by a note from a scientist whose abstract was rejected by the Program Committee of the 2001 Annual Meeting of the Society.

The Board of Directors discussed this at their meeting in February, where I was present, and the exchange of ideas continued on for some time afterwards, via e-mail. At the suggestion of the Society’s newsletter editors, I present for readers’ consideration an edited version of a recent message to the directors. I have edited it to avoid attributing particular opinions to particular individuals, as well as to move the discussion from one of a particular abstract and research group to a more general level.

Here is a paraphrase of some of those remarks.

Recent e-mails from directors to other members of the BEMS board about screening and possibly rejection of abstracts offer two possible reasons for rejection: Quality of science or methods, and the anticipated behavior of the authors. The same two lines of argument are also present—but less clearly separated—in messages we read in the public on-line discussion of the issue.

Questions about the scientific quality are at the core of what the BEMS annual meeting and the Society are all about. The machinery we have set up—program committee, guidelines and criteria, etc., appropriately judge abstracts on these terms. As long as those who make the judgment are using these criteria, others can argue about whether they agree with the judgment, but no one can make an effective argument against the program committee’s right and obligation to act on these principles.

However, some bring up past or anticipated behavior by scientists. These questions usually involve concern about someone misrepresenting a meeting abstract as a publication or as a completed, peer-reviewed piece of work. Comments in a similar vein have been made in the on-line discussions, implying some kind of prejudice on the part of judges—though it’s unclear whether personal prejudice, scientific prejudice or both. Some have asked for the names of the committee members, which, by the way, are published in the abstract book we receive at the annual meeting.

continued
Such questions are based on personal, not scientific issues, and they are a minefield.... But because good people can have awful ideas and awful people can have good ideas, we do have to be careful to judge the science on the science and judge the people, using a different process, on their behavior as people.

We have to decide.... Will we emphasize being open to a wide range of ideas and thereby become more open to misuse of our forum? Or will we try to restrict the use of our programs for purposes outside the science and thereby also restrict the range of ideas? The first definition is the pure model of science, and I would submit that—while perhaps we fall short of its most pure form—this is closer to what we are as a Society.

To make this work as well as it can, we need a very clear statement by the Society about what is and what is not acceptable use of presentations at the meeting. This we basically have. It should be used aggressively if members step over the line. If the case also involves non-members, the statement should be used aggressively with both them and the member.

Stefan Engström, maintainer of the Bioelectromagnetics Web site and moderator of its discussion group, soon sent this message to all subscribers:

“I am very glad to see scientific discussion on this list, and I will use the option to moderate for a few reasons (listed below). It is my hope that this can be a forum for serious exchange, and I don’t want to discourage subscribers to the list to go away because there is a lot of redundant and/or personal messages on the list.

Every post here goes to all subscribers (approximately 300 people). I think it is worth to consider that you have a substantial audience when you post here. Here is what I think should not go on the list, and I moderate accordingly.

1) Severely off-topic (bioelectromagnetics) posts.
2) No new arguments/content.
3) Strictly personal correspondence.

-Stefan

Finally, another “chat” participant made these remarks:

I would like to make a few comments concerning what may appear as conflicts. Recently on this chat site the most frequent conflict seems to be the feeling that new ideas are not being accepted. I do not know of any scientist who feels we know all the answers and thinks the prospects of new knowledge is closed.

The conflicts are not due to the actual facts but in the manner in which we explore new frontiers. I personally fall into a category I believe to be in the middle. I think it is good to jump into free space without a net but then it becomes imperative to develop a net before hitting the ground. Others do their homework first before leaping. This has the advantage of moving with intelligence and the disadvantage of slow progress as everything needs to be worked out before any movement occurs. The other extreme is leaping without any thought and then not ever doing the needed homework. This has the advantage of being able to move quickly but the disadvantage of not ever establishing anything of substance. What is the best method? I believe that is up to the individual.

However, when it comes to convincing the rest of the world your ideas have merit it is no longer a personal choice but the choice of the world audience. Traditionally, science is trial by fire. If you have an idea and it survives being torn apart by your peers then there is a good chance you may have something worth while. For this to occur you must allow your data and theories to be fully exposed.

If you hold back on the secret formula that portion cannot be scrutinized and your theory will not be accepted.

Another problem is that as science advances there is a tendency that for something to be real it must be understood. Whether good or bad this is a very real obstacle for new ideas. One method to overcome this obstacle is to provide data from experiments that test various subsets of the idea. One set of observations, even if repeated hundreds of times, does not make a convincing story. Also, a set of observations that are merely consistent with an idea or theory also does not make a convincing story. In fact, many of the theories and hypothesis that are out there are good preliminary data that can be used to warrant further research. However, it appears many use the preliminary data as proof of concept. It is not proof.

It is my view that everybody involved in low-energy EMF research needs to recognize we need to go to the next level of proof. We have lots of preliminary data, now lets actually prove something.

To join the Bioelectromagnetics chat, visit the Society’s Web site: www.bioelectromagnetics.org The site also features calendar items, past issues of the newsletter, book announcements, occasional job postings, annual meeting registration pages and technical program schedules and details, and more.
THE CASE OF VATICAN RADIO

by Paolo Vecchia, National Institute of Health, Rome

Characteristics of the Vatican Radio station

A broadcasting station of the Vatican Radio is located about 30 km North of Rome. The plant occupies an area of about 2 by 1.5 km, which is part of the Vatican State.

The station is equipped with 29 antennas, for radio broadcasting by frequency modulation (2) and by short-waves (27). FM radiation is emitted almost isotropically, to serve Central Italy; SW are radiated by one or two antennas at a time, along specific directions, to send transmissions in different languages to different areas of the World. Each sector (8 in all) is typically irradiated up to one or two hours per day.

The maximum power of the antennas reach 500 kW for FM, and 600 kW for SW. The electric field strength measured outside the plant, at the time of maximum radiation, reaches values of 15-20 V/m at a few selected locations. The station has raised protest in the past, mainly due to interference problems with domestic devices such as intercoms. More recently, concern has been expressed for possible long term effects; reports of cases of leukaemia and other diseases have been spontaneously collected by local committees of citizens, who claim an incidence of cancer much higher than the average of the Country.

The facts

The Vatican officially adopted the ICNIRP limits several years ago. However, in 1998 a regulation was enforced in Italy setting a limit – for the electric field – of 6 V/m, irrespective of the frequency, not to be exceeded in inhabited areas. The problem arose whether the emission from the Vatican Radio (originating in a foreign Country) should be such as not to make the limits exceeded in the Italian territory outside the plant. Initially, the Vatican refused to modify its plan of transmission, with the argument of its independence and of its compliance with the ICNIRP guidelines. Following this, a diplomatic panel was created to discuss the question.

The case was followed (particularly by the media) with great attention because of the special status of the Vatican, the diplomatic implications, and the ideological aspects. Of special interest is the fact that a case was filed in Court, with three executives (priests) of the radio accused of creating harm to the public health. At the end of March 2001, the results of a survey performed by epidemiologists of the Regional Health Agency of Latium were made public. The survey was performed in response to the claims of local committees that the incidence of childhood leukaemia (and possibly other tumours) in the area was much higher than expected. The results of a retrospective analysis over 14 year showed no increase of childhood leukaemia in the whole area (10 km radius) around the plant. However, a geographical analysis over separate rings around the centre of the plant showed a decreasing risk with increasing distance from the centre of the plant. The relative risk was in fact about 6 between 0 and 2 km, about 2 between 2 and 4 km, and about 1.5 between 4 and 6 km.

Evaluation of these findings requires extreme caution because:

• The observation is based on a very small number of cases (8). In particular, the relative risk of 6 is based on 1 case observed in comparison to 0.16 expected. In the next rings, the observed cases were 2 and 5, respectively.
• No cases (in comparison to about 4 expected) were observed between 6 and 10 km.
• There is no indication of any correlation between the distance from the plant and the level of exposure. On the contrary, the characteristics of the emissions (directionality, intermittence) and of the area (hills, differences between typology of the houses) suggest a lack of correlation. Sparse measurements of electric field strength (outdoor) seem to confirm this hypothesis.
• Childhood leukaemia is known to occur typically in clusters, both in space and in time. In addition, it should be noted that inside the observed cluster (the 8 cases in the inner rings compared to 0 cases in the outer rings) a sub-cluster exists: 4 of the 5 cases between 4 and 6 km are concentrated in the same, small residential village.
• It is also to note that the measurements available, although sparse, were performed on request of the citizens and local committees, at locations and at time of presumed maximum exposure. The electric field level never exceeded the ICNIRP limits. A maximum value of 17 V/m was detected on the terrace of a 7-story building. In the above mentioned residential village, measurements performed in sight of the antennas over a 24 h period showed a maximum below 2 V/m.

Political implications and consequences

Politics has played an important role in the case. The report on leukaemia incidence, that had been sent to the Regional authorities for comments and approval, was unduly made public by the Green Party exactly on the same day when the trial against the executives of the Vatican Radio started in Court. It must also be considered that political elections will take place in Italy at mid-May.

The Minister of the Environment sent an ultimatum to the direction of the Vatican Radio: since there is no possibility of direct intervention on a plant located abroad, he threatened to cut the supply of electric power if the exposure were not reduced below the Italian standard (6 V/m). The initial deadline (March 31) was postponed to April 17, to allow transmissions during the Easter festivities. The decision was taken following a hard debate inside the Council of Ministers. The date has been further moved, first to the end of April and later to the end of May, to allow an experimental survey to be performed jointly by Italian and Vatican experts and an agreement be found by the bilateral panel.

In the meantime, the case has become a top issue of the media, with full-page reports in the newspapers almost daily. The typical message is that incidence of leukaemia near the plant is up to 6 times more than the national average, with no information about the main result, i.e. the absence of an overall increase. Sometimes, the media incorrectly report a 6-fold increase in the whole area.
Not surprisingly, the worries of the local population have dramatically increased. New cases of leukaemia and other diseases are continuously claimed. Based on the data of the survey (and on their interpretation), a new trial has been filed in Court, with the accuse of manslaughter.

The management of the Vatican Radio has decided to reduce emissions, in the attempt to attain compliance with Italian regulations. The first step has been a substantial reduction of the transmission time for FM programs. Later on, the power of some antennas has been reduced. No official communication has been released about the results of measurements performed after these actions. There are rumours that the level of 6 V/m is still exceeded in some limited areas.

To protest against the refusal by other Ministers to immediately act against the Vatican, the Minister of the Environment resigned on March 3. Future developments are unpredictable. Presumably, they will depend upon the findings of the joint survey in progress, but also on the outcome of the political elections, on the conclusion of the hard controversy between the Ministers of the Environment and Health, and on the impact of the protest of scientists.

Disclaimer: Although the intention is to objectively present facts, these notes may reflect the personal point of view of the Author. They do not necessarily represent the position of the Italian National Institute of Health. Also critical remarks are the personal opinion of the Author.

CALIFORNIA EMF PROGRAM POSTPONES PUBLIC MEETING

The California Department of Health Services’ EMF Program postponed its May 7 Scientific Advisory Panel meeting in Oakland, where draft EMF health risk evaluation and policy integration reports were to have been released to the public. No new date has yet been set.

Dr. Raymond Neutra, chief of the DHS EMF Program, said that DHS acted at the request of the California Public Utilities Commission, which asked for a briefing on the risk evaluation before public release.

Ellen Stern Harris, executive director of the Fund for the Environment, Beverly Hills, tried to get the reports released using the Public Records Act, but her request was denied. DHS’s senior staff counsel explained in a letter which was circulated widely by e-mail that the reports are “predecisional” and releasing them before CPUC review might “discourage candid discussion within our respective agencies, inhibit the free exchange of ideas, and thereby undermine each agency’s ability to perform its functions.”

Watch the California EMF Program’s Web site: www.dnai.com/~emf for future developments.
May 12-16, 2002. Seventh International Workshop On Seeds. Salamanca, SPAIN. Some papers related to EMF exposure and biological effects are expected in this seed biology program. Information, on-line registration at: www.geocities.com/workshop_on_seeds/ Mail or fax form to: Congress Secretariat, Halcón Viajes Congresos, Serranos 35, 37008 Salamanca SPAIN. Phone: +34 9 2321 0728; Fax: +34 9 2321 0749. E-mail: congresos@air-europa.com Chair Gregorio Nicols E-mail: gnr@gugu.usal.es  

June 23-27, 2002. Bioelectromagnetics Society 24th Annual Meeting: Loews le Concorde Hotel, Québec, Canada. Room rates: Single $197 Canadian, Double $217 Canadian. Reservations (418) 640-5800. Contact: Gloria Parsley, The Bioelectromagnetics Society, 2412 Cobblestone Way, Frederick, MD 21702. (301) 663-4252; FAX: (301) 694-4948. Email: BEMSoffice@aol.com or gloriaparsley@aol.com Web: www.bioelectromagnetics.org