

BIOEFFECTS

NEWSLETTER

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URSI BIOSYMPIOSIUM - The big news at this time is the upcoming URSI BioSymposium being held at Airlie House near Washington, D. C. beginning 30 October until 4 November. All indications are that there will be attendees from several east European countries, western Europe, South America and even Australia. Several agencies (FDA, NIOSH, Naval Medical Research and Development Command and ONR) have joined together to sponsor a grant to the U. S. National Committee for URSI-National Academy of Sciences. This grant is being used to help defray the expenses of some of the foreign participants. This insures that there is maximum interplay and exchange of information. Papers will be presented in English and in Russian for one session, with simultaneous translation.

Persons who have not pre-registered for this meeting, may find it very difficult to gain admittance due to the limited capacity of Airlie House. However, every attempt will be made to accommodate those who wish to register for one or two days. The daily registration fee is \$30 per day and entitles the registrant to a copy of the SYMPOSIUM PROGRAM AND ABSTRACTS but does not entitle one to the copy of the volume of selected papers which will be published as a Special Supplement to RADIO SCIENCE. See you at Airlie.

POSITION CHANGES - Dr. W. Ross Adey has recently taken on the job of Research Director at the Veterans Hospital in Loma Linda, California. This is a brand new facility and Ross will organize and set-up a lab there dealing with EMF bioeffects as fast as he can. Meanwhile, the very fine work which he began at UCLA continues by the very capable team which he has assembled over the years.

Captain Paul Tyler, MC, USN, who has headed the EMR Project Office at the Naval Medical Research and Development Command, has been assigned as Deputy Director of the Armed Forces Radiobiology Research Institute in Bethesda. Best wishes to both in their new assignments.

This is an informal newsletter compiled as a service to the scientific community interested in biological effects of electromagnetic fields. The views expressed are those of the writer and are not to be construed as the official policy of the Department of Defense or the Department of the Navy.

LITERATURE DIGEST - The latest issue of *Biological Effects of Non-ionizing Electromagnetic Radiation--A Digest of Current Literature* is now on the street. It was previously mentioned in BN that this Digest is available from NTIS. In fact, we gave the accession numbers. However, at least one person has informed us that upon attempting to order back issues from NTIS, he was told that they had never heard of the thing. In the latest issue of the Digest, the AD numbers are listed as well as NTIS, I suggest you contact the Franklin Institute Research Laboratories or the Office of Telecommunications Policy (if they are still in existence).

NEW BOOKS - It is almost becoming a full time job just keeping up with the new books that are appearing in the bioeffects field. By the time you receive this, the book *ZAPPING OF AMERICA* by Paul Brodeur should be available. Brodeur, you may remember, is the chap who wrote the two extensive articles which appeared in *The New Yorker* last December. I have no information on this book at present. Perhaps it will be reviewed in the next issue of BN.

Asher R. Sheppard and Merrill Eisenbud have compiled a critical review of the literature of ELF effects in a book entitled, *BIOLOGICAL EFFECTS OF ELECTRIC AND MAGNETIC FIELDS OF EXTREMELY LOW FREQUENCY*. This review has attempted to cover the literature on the effects in the frequency range of 0 to 300 Hz. Of course this takes care of all electric power generation, transmission and distribution. Over 100 papers were reviewed and the range of subjects is too extensive to cover here. At 271 pages, this book sells for \$15 and is published by, and I assume, available from New York University Press, Washington Square, New York 10003. If you live in New York State, send tax.

James C. Lin of Wayne State University has written a book on *MICROWAVE AUDITORY EFFECTS AND APPLICATIONS*. It is being published by Charles C. Thomas, Springfield, Illinois. I haven't read the book yet (in fact, I am not certain it is off the press) but I am anxious to see what new light Jim has shed on this controversy. I am especially anxious to learn about these applications of the auditory effect.

RECENT PAPERS - Abstracts are given where it is felt that the reader needs to know more than is indicated by the title. An asterick (*) following an author's name indicates affiliation with the Office of Naval Research EMF Program.

Schwan, H. P.* and Foster, K. R.*, "*Microwave Dielectric Properties of Tissue - Some Comments on the Rotational Mobility of Tissue Water*", *Biophysical J.* 17:193, 1977. Abstract: Dielectric permittivity and conductivity data are reviewed for tissue over the frequency range of 0.1 - 10 GHz.

Massoudi, H., Durney, C. H.* and Johnson, C. C.*, "Long-Wavelength Analysis of Plane Wave Irradiation of an Ellipsoidal Model of Man", IEEE Trans. on Microwave Theory and Techniques, MTT-25, No. 1, 41, 1977. Abstract: Expressions are derived for the induced electric fields in an ellipsoidal model of man and experimental animals irradiated by an electromagnetic (EM) plane wave when the wavelength is long compared to the dimensions of the ellipsoid. Calculations of the power absorbed by an ellipsoidal model of man are given for six different orientations of the ellipsoid with respect to the incident plane wave field vectors. The results of the ellipsoidal model of man are also compared with those of the prolate spheroidal model.

Massoudi, H., Durney, C. H.* and Johnson, C. C.*, "Long-Wavelength Electromagnetic Power Absorption in Ellipsoidal Models of Man and Animals", Ibid., 47, 1977. Abstract: The analysis developed in the above paper is applied to ellipsoidal models of humans and experimental animals to obtain the distribution of tissue power absorption and average power absorption for different frequencies and orientations of the model with respect to the field vectors. Comparisons of calculated data with preliminary experimental data on monkeys are given.

Johnson, C. C.*, "The Role of Radio Science in Investigating Electromagnetic Biological Hazards", Radio Sci., 12:349, 1977

Szmigielski, S., et al., "In Vitro and In Vivo Inhibition of Virus Multiplication by Microwave Hyperthermia", Arch. of Virology, 53:71, 1977. Abstract: The effects of microwave hyperthermia (41° and 43°C) on virus multiplication have been explored in vitro (HSV-1 infected primary rabbit kidney cultures) and in vivo (mice infected with HSV-1 or vaccinia).

Flanigan, W. F.*, Bowman, R. R. and Lowell, W. R., "Nonmetallic Electrode System for Recording EEG and ECG in Electromagnetic Fields", Physiology and Behavior, 18:531, 1977

Tell, R. A., et al., "An Examination of Electric Fields Under EHV Overhead Power Transmission Lines", EPA-520/2-76-008, U.S. Environmental Protection Agency, Office of Radiation Programs, 9100 Brookville Road, Silver Spring, Maryland 20910.

Phillips, R. D.* and Kaune, W. T., "Biological Effects of Static and Low Frequency Electromagnetic Fields: An Overview of United States Literature", BNWL-2262, Battelle Pacific Northwest Laboratories. Available from NTIS.

Cleary, S. F.*, "Biological Effects of Microwave and Radio-frequency Radiation", CRC Critical Reviews in Environmental

Control, pp 121-166, June 1977. Comment: This is an extensive review of the bioeffects literature of approximately the past five to seven years. It represents a monumental task on Dr. Cleary's part. He has thoroughly reviewed a number of research papers and lists 100 references. Of course, no attempt was made to include all of the research that has been done in the time period covered--that would be impossible. What Steve has done is to condense into a very concise paper, the essence of the most important work. For this, we applaud him. Appreciation must go also to Dave Janes who so ably refereed this paper.

Fanslow, G. E., "*Liquid Crystal Electromagnetic Radiation Monitor*", J. Microwave Pow., 12:87, 1977. Abstract: Liquid crystals having color play centered at different temperatures are arranged on metal coated and nonmetal coated dielectric substrates and used to monitor electromagnetic radiation. The temperature-dependent light scattering properties of the liquid crystals are used as both the temperature measuring mechanism and the indicating mechanism, with the difference between the temperature indications of the two substrates (one metallized) being a measure of the microwave field.

Ho, H. S. and McManaway, M., "*Heat-Dissipation Rate of Mice After Microwave Irradiation*", Ibid. 93, 1977. Abstract: The heat dissipation rate from individual CFI male mice was determined by a bio-calorimeter before and after exposure to microwave fields. The animals were exposed singly in an environmentally-controlled waveguide apparatus with 2450 MHz CW fields. The results indicated an increased heat-dissipation rate of the animals (compared to sham) for average absorbed dose rates above 12 mW/g.

Bassett, C. A. L., Philla, A. A. and Pawluk, R. J., "*A Non-Operative Salvage of Surgically-Resistant Pseudarthroses and Non-Unions by Pulsing Electromagnetic Fields*", Clin. Orthopaedics, 124:128, 1977. Comment: While this paper is written primarily for the clinician, I have included it because it points out the necessity for those concerned with bioeffects research (approaching it from a hazard standpoint) to be ever cognizant of possible beneficial effects of EM fields when properly applied. Much of this type of research on the possible beneficial applications of low frequency, pulsed fields is being sponsored by NSF.

ANOTHER USSR VISIT - A delegation from the U.S. has just completed a trip to the Soviet Union. The purpose of the trip was to visit laboratories which are doing work on the biological effects of DC and low frequency EM fields and to develop a cooperative work plan on this topic for the next two years. The U. S. scientists participating in the trip were: Drs. D. McRee, J. Elder, A. Guy, W. Kaune, H. Kornberg, H. Mehn,

C. Mitchell and R. Phillips. These visits and exchanges are extremely important as we all seek basic answers to the myriad problems in bioeffects research.

NEW ONR CONTRACTS/GRANTS - Two new proposals were recently approved for funding by the Physiology Program (Electromagnetic Field Effects), Office of Naval Research:

Microwave Effects on DNA, R. W. Gammon and C. Davis, University of Maryland.

Determination of Bound Water in Biological Tissue and Energy Dissipated in Bound Water by Low-Level Microwaves, E. H. Grant and R. J. Sheppard, Queen Elizabeth College, University of London.

MEETINGS, SYMPOSIA AND CONFERENCES:

- 30 Oct - 4 Nov 77 International Symposium on Biological Effects of Electromagnetic Waves. Sponsored by Commissions A and B of the International Union of Radio Science (URSI), Airlie, Virginia.
- 15-17 Nov 77 Symposium - La Sécurité du Personnel Exposé à Une Ambiance Électromagnétique. Organized by L'Université de Bordeaux, France
- 27-30 Jun 78 13th Annual Microwave Power Symposium, Ottawa, Ontario, Canada. First call for papers is already out. Deadline for submission: 7 January. More info from IMPI, P. O. Box 1556, Edmonton, Canada T5J 2N7.
- 27-30 Jun 78 1978 National Conference on the Biological Effects of Electromagnetic Waves, Ottawa, Ontario, Canada. This conference is being held concurrently with the IMPI Symposium and is being sponsored by the Microwave Theory and Techniques Society, Institute of Electrical and Electronic Engineers, and the International Microwave Power Institute, with the cooperation of the U.S. and Canadian National Committees of the International Union of Radio Science (URSI). More information from:

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University of Utah
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1-10 Aug 78

International URSI Symposium on Microwave
Effects, Helsinki, Finland. First call
for papers now in the mail. More infor-
mation from:

S. W. Rosenthal
Chairman, URSI Commission A
"Working Group on Measurements Re-
lated to the Interaction of Electro-
magnetic Fields with Biological
Systems"
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Farmingdale, New York 11735

EDITOR'S NOTE - Literally dozens of letters and phone calls
have been received concerning the BN. With the exception of
one, all have been very positive and the general indication is
that much of what we are trying to get over is, indeed, of some
value. It certainly helps if you, as the reader and a member
of the bioeffects community, would forward to us items which you
think would be of interest to others. We welcome such things as
abstracts, reprints (yours or others), meeting information, new
breakthroughs, whatever. No promise is made that all material
will be published. None will be acknowledged unless accompanied
with a self-addressed, stamped (or franked) envelope.

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