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THE NEW YORK ACADEMY OF SCIENCES

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2 East Sixty-third Street, New York, N.Y., 10021

February 12, 13, 14, 15, 1974

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CONFERENCE ON THE BIOLOGICAL EFFECTS  
OF ELECTROMAGNETIC RADIATION

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All Sessions at  
The Delmonico Hotel  
Park Avenue at 59th Street  
New York, N.Y. 10022  
Except Subscription Dinner at the Academy

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Registration fee:

No charge to members of the Academy and Speakers.

THE NEW YORK ACADEMY OF SCIENCES

Conference Chairman  
Paul E. Tyler, M.D.  
Head, EMR Project Office  
Bureau of Medicine & Surgery  
Department of the Navy  
Washington, D.C.

TUESDAY, FEBRUARY 12, 1974

8:00 A.M.  
REGISTRATION

9:00 A.M.  
ELECTROMAGNETIC RADIATION EFFECT ON THE NERVOUS SYSTEM

Session Chairman: W. R. Adey, M.D.  
Brain Research Institute  
Los Angeles, California

Greetings from the Academy — Kenneth W. Thompson, M.D., President,  
The New York Academy of Sciences.

Introductory Remarks — Overview of Electromagnetic Radiation  
Research: Past, Present, and Future — Paul E. Tyler, M.D., Bureau of  
Medicine and Surgery, Washington, D.C. (1 hr.)

Coffee Break (30 min.)

1. Detection of Weak Electromagnetic Radiation by the Mammalian Vestibulo-Cochlear Complex — R.M. Lebovitz, Ph.D. University of Texas, Dallas, Texas. (20 min.)
2. Microwave Interactions with the Auditory Systems of Humans and Cats — A.W. Guy, Ph.D., University of Washington, Seattle, Wash. (20 min.)
3. Biochemical and Neuroendocrine Aspects of Exposure to Microwaves — S.M. Michaelson, D.V.M., S.-T. Lu, Ph.D., N. Lebeda, and R. Magin, University of Rochester, Rochester, New York. (20 min.)

Luncheon Break

2:00 P.M.

ELECTROMAGNETIC RADIATION EFFECT ON THE NERVOUS SYSTEM (cont'd)

4. A New Theory of the Action of the Organ of Corti and of the Cochlea — J.E. Malcolm, M.D., OBE, F.R.C.S., Central Medical Establishment, London, England. (20 min.)

5. Possible Physical Substrates for the Interaction of Electromagnetic Fields with Biological Membranes — I.T. Grodsky, Ph.D., Cleveland State University, Cleveland, Ohio. (20 min.)

6. The Effects of Microwaves on Isolated Neurons — H. Wachtel, Ph.D., R. Seaman, B.S., and W. Joines, Ph.D., Duke University, Durham, North Carolina. (20 min.)

7. Some Effects of Electromagnetic Radiation on the Brain and Spinal Cord of Cats — E.M. Taylor, Ph.D., B.T. Ashleman, M.S., and A.W. Guy, Ph.D., University of Washington, Seattle, Washington. (20 min.)

Coffee Break (30 min.)

8. Effects of Modulated VHF Fields on the Central Nervous System — S.M. Bawin, Ph.D., R. Gavalas-Medici, Ph.D., W.R. Adey, M.D., and L. Kaczmarek, Ph.D., Brain Research Institute, Los Angeles, California. (20 min.)

9. Synchronization of Cortical Neurons by a Pulsed Microwave Field: Evidenced by Spectrum Analysis of Electrocoorticogram into the White Rat — B. Servantie, M.D., A.-M. Servantie, Ph.D., J. Etienne, ESSAM-CERB/Hopital I.A. Sainte-Anne, Toulon, France. (20 min.)

10. Do Microwaves Alter Nervous System Structure? — E.N. Albert, Ph.D., The George Washington University Medical Center, Washington, D.C. and M. DeSantis, Ph.D., Georgetown University Medical & Dental School, Washington, D.C. (20 min.)

11. Experimental Morphologic and Electroencephalographic Studies on Microwave Effects on the Nervous System — S. Baranski, M.D. and Z. Edelwejn, M.D., Institute of Aviation Medicine, Warsaw, Poland. (20 min.)

Discussion. (30 min.)

WEDNESDAY, FEBRUARY 13, 1974

9:00 A.M.

ELECTROMAGNETIC RADIATION EFFECT ON SPECIAL SENSES

Session Chairman: D.D. Donaldson, M.D.  
Massachusetts Eye & Ear Infirmary  
Boston, Massachusetts

1. Experimental Microwave Cataractogenesis — B. Appleton, M.D.,  
and S. Hirsch, M.D., Walter Reed Army Medical Center, Washington,  
D.C. (20 min.)

2. Screening for Cataracts -- R.D. McAfee, Ph.D., L.L. Cazenavette,  
M.S., Veterans Administration Hospital, New Orleans, Louisiana, and  
M.G. Holland, M.D., Tulane University School of Medicine, New Orleans,  
Louisiana. (20 min.)

3. Some Current Studies on Microwave Ocular Effects — R.L. Carpenter,  
Ph.D., E.S. Ferri, M.S., and G.J. Hagan, Northeast Radiological  
Laboratory, Winchester, Massachusetts. (20 min.)

Coffee Break (30 min.)

4. Theoretical and Experimental Studies of Microwave Cataracts in  
Rabbits — P. Kramar, M.D., University of Washington, Seattle, Wash-  
ington. (20 min.)

5. Ultrastructural Changes in the Rabbit Lens Induced by Microwave  
Radiation — R.J. Williams, M.D., A. McKee, D.V.M., and E.D. Finch, Ph.D.,  
Naval Medical Research Institute, Bethesda, Maryland. (20 min.)

6. Ascorbic Acid Changes in Cultured Rabbit Lenses Following Microwave  
Irradiation — J.J. Weiter, M.D., E.D. Finch, Ph.D., W. Schultz, D.Sc.,  
and V. Frattali, Ph.D., Naval Medical Research Institute, Bethesda,  
Maryland. (20 min.)

Discussion. (30 min.)

Luncheon Break

2:00 P.M.

BIOCHEMICAL AND BIOPHYSICAL EFFECTS

Session Chairman: K.D. Straub, M.D.,  
University of Arkansas Medical School  
Little Rock, Arkansas

1. Microwave Effects on the Blood-Forming System With Particular Reference to the Lymphocyte — P. Czerski, M.D., National Research Institute of Mother and Child, Warsaw, Poland. (20 min.)

2. The Effect of Electromagnetic Radiation on the Hematopoietic Stem Cells of Mice — D. Rotkowska, Ph.D., and A. Vacek, Ph.D., Czechoslovak Academy of Sciences, Brno, Czechoslovakia. (20 min.)

3. The Effect of Microwaves on Isolated Rat Liver Mitochondria — J.A. Elder, Ph.D., and J.S. Ali, M.S., National Environmental Research Center, Research Triangle Park, North Carolina. (20 min.)

Coffee Break (30 min.)

4. A Comparison of Thermal and RF Exposure Effects on Trace Metal Content of Blood Plasma and Liver Cell Fractions of Rodents — J.W. Frazer, Ph.D., T. Rupp, M.S., and J. Montet, B.S., USAF School of Aerospace Medicine, Brooks Air Force Base, Texas. (20 min.)

5. Effects on Microsomal and Mitochondria Preparations — K.D. Straub, M.D., Ph.D., University of Arkansas Medical School, Little Rock, Arkansas. (20 min.)

6. Effects of Microwaves on Enzymes — E.K. Yeagers, Ph.D., Georgia Institute of Technology, Atlanta, Georgia. (20 min.)

Discussion. (30 min.)

THURSDAY, FEBRUARY 14, 1974

9:00 A.M.

ELECTROMAGNETIC RADIATION EFFECTS ON GENETICS AND DEVELOPMENT

Session Chairman: W.M. Leach, Ph.D.  
Bureau of Radiological Health  
Rockville, Maryland

1. Genetic Continuity and Metabolic Regulation as Seen by the Effects of Various Frequencies of Microwaves on these Phenomena — S.J. Webb, D.Sc., University of Saskatchewan, Saskatoon, Canada. (20 min.)
2. Effects of Non-Ionizing Electromagnetic Radiation on Single Cell Biological Systems — C.F. Blackman, Ph.D., S.G. Benane, B.S., C.M. Weil, Ph.D., and J.S. Ali, M.S., National Environmental Research Center, Research Triangle Park, North Carolina. (20 min.)
3. Effects of Electromagnetic Radiation on Implantation and intra-uterine Development of the Rat — F. Dietzel, Dr. Med., Wilhelm-Conrad-Rontgen-Klinik, Giessen, Federal Republic of Germany. (20 min.)

Coffee Break ( 30 min.)

4. Some Effects of Exposure of the Coturnix Quail Embryo to 2.45 GHz Microwave Radiation — D.I. McRee, Ph.D., P. Hamrick, Ph.D., J. Zinkl, Ph.D., National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina, P. Thaxton, Ph.D., and C. Parkhurst, Ph.D., North Carolina University, Raleigh, N.C. (20 min.)
5. The Effect of Electromagnetic Fields on Fecundity in the Chicken — W.F. Krueger, Ph.D., A.J. Giarola, Ph.D., J.W. Gradley, M.S., and A. Fhreckenhamer, Texas A&M University, College Station, Texas. (20 min.)
6. Threshold Effects of Microwave Radiation on Embryo Cell Systems — S. Pyle, B.S., D. Nichols, M.S., E. Gamow, Ph.D., and F.S. Barnes, Ph.D., University of Colorado, Boulder, Colorado. (20 min.)

Discussion (30 min.)

Luncheon Break

2:00 P.M.

BEHAVIORAL EFFECTS OF ELECTROMAGNETIC RADIATION

Session Chairman: D.R. Justesen, Ph.D.  
Veterans Administration Hospital  
Kansas City, Missouri

1. Microwave Dose-Response Relations on Two Behavioral Tasks —  
W.D. Galloway, Ph.D., Bureau of Radiological Health, Rockville,  
Maryland. (20 min.)

2. Preliminary Investigations of the Influence of Low-Level Micro-  
wave Irradiation on the Spontaneous Motor Activity of Rats —  
G.H. Heebels, E.E., Laboratory of the Armed Forces, Oegstgeest,  
Netherlands, B. Roberti, M.D., and O.L. Wolthuis, M.D., Ph.D., Medical  
Biological Laboratory TNO, Rijswijk, Netherlands. (20 min.)

3. Effects of Microwave Radiation on Behavioral Baselines — J.R.  
Thomas, Ph.D., E.D. Finch, Ph.D., and D.W. Fulk, Ph.D., Naval Medical  
Research Institute, Bethesda, Maryland. (20 min.)

Coffee Break (30 min.)

4. Neural Function and Behavior: Defining the Relationship — A.H.  
Frey, Ph.D., Randomline Inc., Willow Grove, Pennsylvania. (20 min.)

5. Behavioral Effects of Pulsed Microwave Irradiation — E.L. Hunt,  
M.S., N.W. King, Ph.D., and R.D. Phillips, Ph.D., Battelle Pacific  
Northwest Laboratories, Richland, Washington. (20 min.)

6. Behavioral, Physiological, and Cytological Reactions of Brain to  
Microwaves — Yu. A. Kholodov, Ph.D., Academy of Sciences of USSR,  
Moscow, USSR. (20 min.)

Discussion. (30 min.)

FRIDAY, FEBRUARY 15, 1974

9:00 A.M.

DOSIMETRY OF ELECTROMAGNETIC RADIATION

Session Chairman: R.C. Baird, Ph.D.  
National Bureau of Standards  
Boulder, Colorado

1. Contrast of Dose Distribution in Phantom Heads Due to Aperture and Plane Wave Sources — H.S. Ho, Ph.D., Bureau of Radiological Health, Rockville, Maryland. (20 min.)

2. A Discussion of Three New Models of Isotropic Electromagnetic Hazard Meters — R.R. Bowman, B.S., and D.R. Belsher, B.S., National Bureau of Standards, Boulder, Colorado. (20 min.)

3. Microwave Energy Distribution Measurement in the Proximity of Man and Their Practical Application — D.E. Beischer, Ph.D., and V.R. Reno, Ph.D., Naval Aerospace Medical Research Laboratory, Pensacola, Florida. (20 min.)

Coffee Break (30 min.)

4. A Broadband, Miniature Electric Field Probe — M.L. Swicord, M.S., H. Bassen, B.S., Bureau of Radiological Health, Rockville, Maryland, and J. Abita, Ph.D., Johns Hopkins Applied Physics Laboratory, Silver Spring, Maryland. (20 min.)

5. Measurement of Power Absorption by Human Phantoms Immersed in Radio-frequency Fields — S.J. Allen, USAF School of Aerospace Medicine, Brooks Air Force Base, Texas. (20 min.)

6. Field Measurements, Absorbed Dose, and Biological Dosimetry of Microwaves — R.D. Phillips, Ph.D., E.L. Hunt, M.S., and N.W. King, Ph.D., Battelle Pacific Northwest Laboratories, Richland, Washington. (20 min.)

7. A Pyroelectric Probe for Measurement of Microwave Power Density Under Far-Field Conditions — G.K. Huddleston, M.S., Georgia Institute of Technology, Atlanta, Georgia, and D.I. McRee, Ph.D., National Institute of Environmental Health Sciences, Research Triangle Park, North Carolina. (20 min.)

Discussion. (30 min.)

Luncheon Break



2:00 P.M.

PANEL DISCUSSION

1. Results of the Polish Conference — S.M. Michaelson, R.L. Elder, B. Appleton, S. Baranski, R.C. Bowman, and M.L. Shore.

AFTER DINNER PANEL DISCUSSION\*

1. Future Research Directions and Needs in Biological Electromagnetic Radiation Research — K.D. Straub, D.R. Justesen, B. Servantie, P. Czerski, and A.W. Guy. (45 min. to 1 hr.)

\*Note: To be inserted in either wed or thurs schedule.