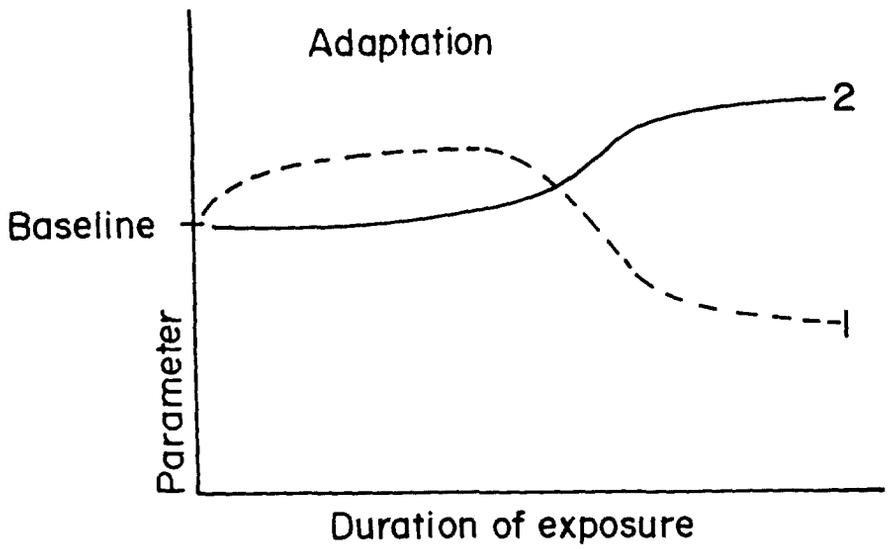

Two suggested adaptation processes in response to microwave exposure.

1). Another form of adaptation which they discuss involves the idea that in the initial stages of exposure, animals can compensate for the microwave stress without changes in biological indicators. After a period of time, the animals can no longer adapt, and biological changes are then observed (curve 2).

Most Soviet research is performed, therefore, at low levels of exposure for long exposure duration. They consider that power densities above 1 mW/cm.^{2} are high enough to produce harmful effects, and see no reason to perform research above this level. When we respond that in some of our experiments we see no significant changes at exposure levels above 1 mW/cm., their answer is that we did not expose long enough. Most of their low level experiments are for six months to a year, while American experiments are usually in terms of a few weeks. Long-term experiments using low levels of microwaves must be performed in the United States before the Soviet results can be verified or refuted.

Some Reported Biological Effects

Before reporting on Soviet and other Eastern European biological effects, the results of the U.S.-U.S.S.R. cooperative program should be

briefly reviewed. In the early stages of the cooperative program, it consisted mainly of an exchange of results on projects related to the central nervous system and behavior. American research consisted primarily of acute experiments with exposure levels generally of 5 mW/cm.^{2} and above, while Soviet experiments were long-term, low-level experiments at 500 μW/cm.^{2} and below. At the end of the first year of the cooperation, the Soviets reported changes in bioelectric brain activity at 10, 50, and 500 μW/cm.^{2} in rats and rabbits exposed for 7 hours/day for 30 days to 2,375 MHz. radiation. Levels of 10 and 50 μW/cm.^{2} stimulated brain activity, while 500 μW/cm.^{2} suppressed activity as seen from an increase of slow, high amplitude Δ-wave in rabbits. At 500 μW/cm.^{2} a decrease in capacity for work, in investigative activity, and sensitivity to electric shock threshold in rats were reported. Research by American investigators on rats exposed to 5 mW/cm.^{2} for shorter durations of exposure to 2,450 MHz. radiation showed no statistical difference in electroencephalogram, no change in locomotive activity in a residential maze, and no change in performance on a fixed ratio schedule of reinforcement below 5 mW/cm.^{2} (0.5 and 1.0 mW/cm.^{2}) but a trend toward decrease in performance at 5 mW/cm.^{2} and a large decrease in performance at 10 and 20 mW/cm.^{2}

It became obvious that, except for our being more familiar with their experimental design, we were no closer to understanding differences between American and Soviet results. It was then decided to perform a duplicate experiment to determine whether similar effects could be observed. Rats were exposed from above for seven hours/day, seven days/week for three months to 500 μW/cm.^{2}. Dr. Richard Lovely of the University of Washington, project leader on the duplicate project, spent four weeks in the Soviet Union to observe the behavioral and biochemical tests performed on the animals. The American study found a drop in sulfhydryl activity and blood cholinesterase as reported in the Soviet study. Blood chemical analyses at the termination of three months exposure indicated that exposed animals, relative to controls, suffered from aldosteronism. The latter interpretation of the high sodium-low potassium levels found in the blood was confirmed by necropsy and histopathologic study of the adrenal glands, revealing that the zona glomerulosa was vacuolated and hypertrophied. In addition, *all* behavioral parameters assessed at the end of three-month exposures revealed significant differences between groups in the same direction as those reported in the Soviet study, i.e., increased threshold to footshock detection, decreased activity in an

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TABLE I. FREQUENCY OF HYPOTONIA IN PERSONNEL EXPOSED TO MICROWAVES ACCORDING TO SOVIET AUTHORS

Author and year	*No. of individuals examined*	*Frequency of hypotonia %*
Kerovski, A.A., 1948	87	38
Osipov, Ju A., 1952	108	30
Shipkova, V.A., 1959	110	20
Orlova, A.A., 1960	525	26-33, various groups
Uspenskaja, I.V., 1961	100	30
Volfavskaja, R.N. et al., 1961	101	27-45, various groups
Frelova, L.T., 1963	172	25.6
Komarov, F.I. et al., 1963	53	22.6
Gembricki, E.V., 1966	210	14

Reproduced by permission from Baranski, S. and Czerski, P.: *Biological Effects of Microwaves.* Stroudsburg, Pa., Dowden, Hutchinson and Ross, 1976.

open field, and poorer retention of an avoidance response when reassessed following conditioning. This replication of the Soviet results at 500 μW/cm.² emphasizes the need for additional long-term, low-level microwave bioeffects research.

Effects on human beings. Most of the bioeffects research in Eastern European countries is performed by Soviet and Polish investigators. A small amount of data, mainly effects on human workers, have been reported by Czechoslovakian scientists. Reported effects on personnel occupationally exposed to microwaves has been summarized by Baranski and Czerski[2] and are shown in Tables I and II. These results come primarily from two groups in the Soviet Union who have done extensive clinical studies on microwave workers. Baranski and Czerski[2] refer to the groups as the Moscow group and the Leningrad group. The Moscow group has reported changes in white blood cells, although no characteristic changes in peripheral blood have been found. Blood proteins, serum histamine content, and enzyme activity have been reported but they returned to normal levels after a few days of rest. The influence of microwaves on the autonomic nervous system was evidenced by reports of vagotonia, bradycardia, and hypotonia. With periodic exposure to power density levels of 0.1 to 10 mW/cm.², marked changes in cardiac rhythm (variability or pronounced bradycardia) were reported. Hypotonia was one of the more pronounced effects (Table I). Prolonged exposure to power density levels from 0.01 to 0.1 mW/cm.² produced effects similar to those

TABLE II. COMPLAINTS OF MICROWAVE WORKERS (%) ACCORDING TO VARIOUS AUTHORS

Author and year	*Headaches*	*Fatigue disproportional to effort*	*Sleep disturbances*	*Irritability*	*Abnormal sweating*	*No. of workers examined*
Uspenskaja, N.V., 2963	37	31	29	9	7	100
Sadtchikova, M.N., 1963 (various groups)	12-39	20-35	—	8-27	—	447
Kilmkova-Deutschova, 1963 (Czech.)	43	39	35	—	—	73
Serel, 1959 (U.S.S.R.)	43	4	45	10	—	103
Tjagin, N.V., 1966 (U.S.S.R.)	33.5	46.2	25.3	9.6	25.5	573
Ramzen-Evdokimov and Sorokin, 1970 (U.S.S.R.)	44	29	35	36	25	155
Controls						
Uspenskaja, 1963	15	22	2	10	—	100
Sadtchikova, 1963	8	10	—	8	—	100
Tjagin, 1966	10.8	5.9	8.7	—	2.7	184
Ramzen-Evdokimov and Sorokin, 1970	7	8	3	—	4	50

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mentioned above. The symptoms were less pronounced and reversible after periods of rest.

The Moscow group also reports that chronic exposure leads to a neurocirculatory syndrome in three stages. The first symptoms are reversible and include changes in blood pressure and cardiac rhythm. In the second stage, cardiovascular changes become more pronounced, and electroencephalographic changes which indicate disturbance of the diencephalan were also found. Hyperactivity of the thyroid is also indicated. A condition defined in Soviet literature as an "asthenic state" may develop. Such subjective complaints as headaches, excitability and irritability, fatigue, and pains around the cardiac region (Table II) characterize this stage. The third stage of effects is characterized by a greater magnitude of change in the complaints and symptoms and additional electroencephalographic changes.

The Leningrad group discusses their findings in terms of an acute microwave syndrome and a chronic microwave syndrome. The acute syndrome is characterized by subjective complaints of headaches, nausea, vertigo, and sleep disturbance. Hypertonia, changes in cardiac rhythm, skin rash, and decrease in amplitude of electroencephalographic alpha waves are also characteristic. Symptoms are transient and disappear completely after rest. The chronic syndrome is expressed in terms of adaptive processes. Subjective complaints of headaches, fatigue, and the like occur during the first three months of exposure, and reappear about the sixth to eighth month. After the first year a period of adaptation occurs which varies in duration. The complaints and symptoms of neurovegetative disturbances reappear after five years of work (chronic overexposure syndrome). This chronic overexposure syndrome is characterized by complaints of headaches, irritability, sleep disturbances, weakness, decrease of sexual activity, pains in the chest, and a general unhealthy feeling ("a general feeling of ill-being").

A large number of Polish clinical studies confirm the Soviet findings on the periodicity of the subjective complaints for exposures to 1 to 10 mW/cm.^{2}.[2] Subjective complaints were exactly the same as described by the Soviet authors (Table II), and were observed in up to 70% of persons exposed to the 1 to 10 mW/cm.^{2} power density levels. The few Czechoslovakian reports (Klimkova-Deutschova[1] and Serel[2]) agree with the Soviet authors (Table II). They also discuss symptoms in terms of a "neurasthenic syndrome."

TABLE III. SOME DATA ON THE EXPOSURE OF MAN AND ANIMALS TO MICROWAVE FREQUENCY FIELDS (ARRANGED ON INTENSITY SCALE)

Power density		
W/cm.^{2}	1	Eye cataracts in dogs after exposure for three to five hours
	800	
	600	(L,M) Pain sensation during exposure
	300	Brief increase in blood pressure; after 20 to 60 minutes marked decrease (cat, rabbit, dog)
	200	(L) Malformation of offspring after exposure for 10 to 15 minutes (chicken eggs, λ = 12.6 cm), death of cats and rabbits (t = 20 to 60 minutes). Reduction of redox in tissue
mW/cm.^{2}		
	100	(M) Increase in blood pressure with subsequent marked decrease; in case of chronic exposure—stable hypoxia. Stable morphologic changes in the cardiovascular system. Bilateral cataracts.
	40	(L) Increase in blood pressure with subsequent marked decrease; multiple hemorrhages, λ = 3 to 10 cm, in liver (dilatation of vessels and hemorrhages λ = 10 cm.). Increase in blood pressure of 20 to 30 mm. Hg (exposure for 0.5 to 1.0 hour).
	10	(M) Changes in conditioned reflex activity, morphological changes in cerebral cortex (L). Vague shifts in blood pressure (exposure time 150 hours), change in blood coagulability. Hyperplasia of liver cells, λ = 3 to 10 cm. (chronic exposure). ECG changes (wavelengths other than DTsV—expansion not given). Change in receptor apparatus.
	5	Threshold intensity at which there are changes in the testis and blood pressure changes (multiple exposure). Brief leukopenia and erythropenia. Darkening of the crystalline lens.
	3	(M) Decrease in blood pressure, tendency to quickening of pulse, fluctuation of cardiac blood volume.
mW/cm.^{2}		
	1	(M) Decrease in blood pressure, tendency to quickening of pulse, insignificant variations in cardiac blood volume. Decrease in blood pressure level, decrease in ophthalmotone (t: daily, 3.5 months). Disadaptation, disorders of immunological protection control mechanisms (L).
	400	Depression of secretions in dogs
	300	(L,M) Some changes in the nervous system in case of exposure for 5 to 10 years
	200	Changes in function of neurons in dogs
	100	(L) Tendency to decrease in blood pressure with chronic exposure
	40	(L) Tendency to decrease in blood pressure with chronic exposure
μW/cm.^{2}		
	20	(M) Thinning of pulse, tendency to a decrease in arterial pressure. Cases of body sensitivity observed. Well-expressed increase in skin temperature in persons earlier exposed.
	M	Data applies to man—all other to animals
	L	Lowest power density indicated by authors

Source: Minin, B.A.: *Microwaves and Human Safety*. U.S. Joint Publication Service, JPRS 65506. August 20, 1975.

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TABLE IV. SOME RESULTS OF EXPERIMENTAL STUDIES ON THE BIOLOGICAL EFFECTS OF VERY LOW INTENSITY MICROWAVES (UP TO 150 μW/cm.^{2})

Investigated function	*Radiation intensity μW/cm.^{2}*	*Character of changes*	*Investigator*
Body weight	150	Lag in weight (chronic experiment)	V.V. Markov
Arterial pressure	150	Biphasic course with marked hypotension (chronic experiment)	V.V. Markov
Reproductive function	150	Decreased fertility, decreased litter size, increased number of defective progeny, increased embryonic mortality etc. (chronic experiment)	A.N. Bereznitskaya et al.
Central nervous system	10-20 and higher	1. EEG changes with predominant synchronization (acute experiment)	Z.V. Gvozdikcova et al.
	150	2. Bivariant shifts with predominance of activation (acute experiment)	
	150	3. Bivariant shifts in the subcortical-basal structures (chronic experiment)	
Electromyography	150	Increased electrical activity of active unit	V.V. Markov
Hypothalamus-drenal cortex System	150	1. Weight change of endocrine glands (hypothysis adrenals) 2. Change in the neurosecretory function of the hypothalamus. 3. Tendency for increased levels of norepinephrine in the adrenals	N.K. Demokidova
Metabolism	150	Changes in water and electrolyte metabolism (Na, K, water, and total nitrogen excretion)	N.K. Demokidova
Immunology	150	Inhibition of neutrophils phagocytic activity	A.P. Vokova and V.V. Markov

Source: Gordon, Z.V., editor: *Biological Effects of Radiofrequency Electromagnetic Fields*. U.S. Joint Publication Service, JPRS 65506, August 20, 1975.

TABLE V. RADIOFREQUENCY STANDARDS FOR OCCUPATIONAL EXPOSURE TO CONTINUOUS WAVE FIELDS (WORKING DAY)

Country	*Radiation frequency (GHz.)*	*RFR intensity (mW/cm.²)*
United States		
ANSI*	0.01-100 GHz.	10
OSHA†	0.01-100 GHz.	10
ACGIH‡	0.1 -100 GHz.	10
Great Britain	0.3 - 30 GHz.	10
Canada	0.1 -100 GHz.	10 (1 proposed)
Sweden	0.3 - 3 GHz.	1
Poland	0.03-300 GHz.	0.2
Czechoslovakia	0.3 -300 GHz.	0.025
U.S.S.R.	0.3 -300 GHz.	0.01

*American National Standards Institute
†Occupational Safety and Health Administration
‡American Congress of Governmental Industrial Hygienists
Note: Some countries have more permissive intensities for shorter exposure times and more restrictive intensities for exposure of the general population.

Effects on animals. A compilation of many Soviet reports on the effects of microwave radiation on animals is presented (Tables III and IV). Both Soviet and Polish investigators report behavioral, central nervous system, cardiovascular system, biochemical, endocrine and metabolic, hematological and reproductive functional changes in animals. All of these reported effects (Tables III and IV) were observed at power densities equal to or less than 10 mW/cm.^{2} and many of the effects were observed at power densities less than 1.0 mW/cm.^{2} Biological changes in both human beings and animals have been reported below 500 μW/cm.^{2}

MICROWAVE EXPOSURE STANDARDS

The current standards for occupational exposure to continuous wave fields for a working day show large differences between Soviet and other Eastern European countries and western countries (Table V). Although Gordon[3] also presents a permissible exposure level of 1 μW/cm.^{2} for the general population as well as the 10 μW/cm.^{2} for occupational exposure, the Soviet Union does not have at this time a "legal" permissible general population exposure levels. However, the Institute of General and Communal Hygiene in Kiev, under the direction of the Soviet Ministry of Health, has proposed a general population standard for microwave exposure of 5 μW/cm.^{2} (Table VI). This maximum permissible level is enforced at present and will become an official standard at the end of this

TABLE VI. MAXIMUM ALLOWABLE LEVELS (MAL) OF ELECTROMAGNETIC ENERGY IN THE HUMAN SETTLEMENTS

Radiowaves ranges	*Limits of ranges (frequency, wavelength)*	*MAL of EMW energy on the dwelling territory*
Long waves	30-300 kHz. (10-1 km.)	20 V/m.
Middle waves	0.3-3 MHz. (1-0.1 km.)	10V/m.
Short waves	3-30 MHz. (100-10 m.)	4 V/m.
Ultrashort waves	30-300 MHz. (10-1 m.)	2 V/m.
Microwaves 24-hour exposure	300 MHz.-300 GHz. (1 m.-1 mm.)	5 μW/cm.^{2}

year unless reasons not to accept it are presented to the Ministry of Health.

Differences in the meaning of standards exist between the Soviet and other Eastern European countries and the United States. First, the maximum permissible exposure level is set at the value where no biological effects occur. No differentiation between effects and hazards is made in setting their standards. Although most of their reported effects at low levels are reversible and return to normal levels after a period of time, and although they recognize that a difference between an effect and a hazard might exist, these facts are not considered in setting maximum permissible levels. Second, the occupational and general population standards in the Soviet Union and other Eastern European countries are not applicable to persons in military and space programs. This enables them to avoid the problems of restrictive use in high priority applications when setting very stringent maximum permissible exposure levels for lower priority situations. This exclusion of individuals in certain work activities is of course impossible in the United States if harmful effects do in fact occur at a given level and duration of exposure. Unfortunately, with the data base that exists today, this "safe" level cannot be set with certainty for either the general population or occupational groups.

SUMMARY

The Soviet and other Eastern European countries have published much information on the biological effects of microwave radiation. Almost no contact between Eastern European and Western scientists on this problem existed prior to 1972, when the cooperative agreement on environmental

health was signed with the Soviet Union. Since 1972 scientific exchanges have occurred on an annual basis with some American scientists staying as long as six weeks to observe Soviet research. Other exchange programs between Polish investigators and American agencies have taken place over the past several years. The exchanges have provided us with a better insight into research in these countries.

Because of my direct involvement with the U.S.-U.S.S.R. cooperative program, this paper has concentrated on Soviet research. These institutes stress human clinical studies and long-term, low-level effects on whole animal systems. They report an "asthenic syndrome" in occupationally exposed workers, characterized by headaches, irritability, fatigue, sleep disturbances, pains in the chest, and a general feeling of ill-being. Polish and Czechoslovakian investigators report the same human effects as the Soviet investigators. Reports of animal studies by Soviet and Polish investigators at exposure power densities of 10 mW/cm.^{2} and below include effects on central nervous system, behavior, cardiovascular system, hematology and blood biochemistry, immunology, endocrinology and metabolism, and reproductive function.

Maximum permissible exposure levels in the Soviet Union and other Eastern European countries and accepted safe levels in the United States differ drastically. For a full working day of exposure, the Soviet standard is 1,000 times less than that presently accepted in the United States. However, the Soviet level is set where supposedly no biological changes occur, even if reversible. No evaluation of the biological changes in terms of harmful consequences is incorporated into the standard. It should also be noted that certain programs (military and space) do not adhere to the same requirements as those set by the Soviet Ministry of Health.

Questions and Answers

DR. RUSSELL CARPENTER: Dr. McRee, were methods of measuring the microwave levels of power what you showed us, how can we really take any stock in what they offer? When they say "low levels" and one measures it with plaster walls and no anechoic chambers, I do not know what their device was. Do you think their measurements are very reliable?

DR. McREE: The PO-1 meter that they used is a reliable device for measuring incident power density. If they were exposing the animal at 1 or 10 mW/cm.^{2} and one had a 10 to 100 amplification factor or error factor in

the measurement, obviously it could be a high level thermal effect. But they report biological changes at 10 μW/cm.^{2} and I just cannot see that much error. I would estimate a factor of 10 in that particular exposure. Dr. William Guy and I had some meters over there but we, unfortunately, were not allowed to take some measurements that we wanted, but one can look at the reflectivity and so forth at 10 μW incident and see no greater increase than about 100 μW to 1 mW. They do not report specific absorption rates. In fact, I have never seen them measure or attempt to measure these. Because they say that at their levels they have no heating. I could not measure a specific absorption rate at 10 μW/cm.^{2} So they don't really feel there is a need. They have improved their exposure systems. The plaster walled room shown in the slide with the animal in front of the diathermy unit has now been replaced by a standard gain horn irradiator, animals in the far field, and microwave absorbers on the walls. We have done a duplicate project with them. At exposure to 500 μW/cm.^{2} for seven hours per day, seven days a week, for three months, we examined blood chemical and behavioral changes. Behavioral changes measured were almost identical to those measured by Shandala's group. This work at the University of Washington by Dr. Lovely, I think, amplifies the problem, or rather the realities, of the situation. We must do some chronic low level work, and we might be surprised. I think that Lovely and Guy were probably more surprised than anyone else that they found those results at a half mW/cm.^{2}

MR. EDWARD L. HUNT (Walter Reed Army Institute of Research): The Russians have begun to adopt some of the same essential kinds of specifications that we use. For example, Tyazhelov in Helsinki has used watts per kilogram, which is our specific absorption rate (SAR).

DR. MCREE: They have begun to do this, particularly where it is relevant, where they think they can measure specific absorption rates. Of course, one can measure such rates in any condition if one just exposes at a higher power density level and extrapolates down to the low level at which one tries to do the experiment. But one encounters heat transfer conduction problems because one is basically measuring the temperature.

MR. GEORGE WILKENING: Is it a valid argument not to use SAR because of heat? One doesn't necessarily have to have it, does one?

DR. MCREE: One must measure the fields or the temperature and unless the BRH field probe is as good as they say, and is made available....

DR. JAMES FRAZER: Dr. McRee, you are only halfway to the solution.

When you measure SAR, you indeed measure the electric field in the tissues.

DR. McREE: I agree, but presently most people obtain SAR from temperature measurements. Most people do not have a field probe with which to measure local fields. Most do have a temperature measuring device.

DR. DON R. JUSTESEN: Does this not imply that human beings are more sensitive to weak electromagnetic fields than the best sensors that the engineers can devise? Presumably, it is beyond the capability of the engineers to detect these fields, while the human being not only reacts to them but suffers terribly from all manner of neurasthenic illness. Is this not the implication?

DR. McREE: You are trying to make a point. What is it?

DR. JUSTESEN: It is possible that the central nervous system is the most sensitive of all instruments to weak radiofrequency fields—that we could throw away our power-density meters and more accurately index the presence of extremely weak but nonetheless harmful fields simply by counting the number of factory workers or embassy employees with neurasthenic symptoms.

MR. WILKENING: To use the incidence of a malady in which the role of microwaves is at best conjectural as an index of field strength would certainly beg the causal question.

DR. JUSTESEN: Precisely my point. I spoke with tongue in cheek. Although I do not disparage the sensitivity of the nervous system to electromagnetic fields, I do disparage the tendency of some individuals to blame any manifestation of disease on the microwaves. A good case in point is Dr. Milton Zaret's assertion[5] that over-the-horizon radar beams from the Soviet Union are responsible for the high incidence of cardiac disease and heart failure in the North Karelia district of Finland.[1] There is little doubt that the Soviet-launched radiation incident on the inhabitants of this district is unmeasureably small—much less than the microwave radiation emitted by the human body. One must disparage the assertion of an etiological role of any agent in any pathological condition in the absence of measurement, correlation, and verification.

DR. McREE: I understand the point Dr. Justesen makes, and it is a valid one. We should not jump to the conclusion that health effects found in persons who might be in a location where microwaves are present are due to the microwave radiation. It is important to characterize the microwave

radiation levels and any other environmental factors which might be present. However, the Soviets can measure accurately microwave levels in the low μW/cm.^{2} range and have conducted long-term experiments on animals at these levels. Reversible biological changes have been reported in these experiments at power density levels as low as 5μW/cm.^{2}

DR. JUSTESEN: Dr. Zorach Glaser, formerly with the Department of the Navy, and now in transition from the National Institute of Occupational Safety and Health to the FDA's Bureau of Radiological Health, is owed a debt of gratitude by all physicians, biologists, and biological engineers who labor in the radiofrequency field. For years Dr. Glaser has performed the nearly thankless task of cataloging, updating, and disseminating titles and sources of published information on biological effects of radiofrequency fields. His current compendium exceeds 5,000 titles. Someone should acknowledge Dr. Glaser's onerous but highly useful labor.

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INTRODUCTION

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1.) To provide the practicing physician with a clear definition of Bioelectricity and EMF.
2.) To improve the attendants' awareness of the effects of Bioelectricity and EMF on the human body.
3.) To develop EMF models for clinical use.
4.) Present treatment modalities for the sensitive patient.

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Upon completion of this conference, the physician should be able to:

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2.) Understand the problems associated with EMF and Bioelectricity.
3.) Be able to identify, diagnose, treat and prevent these environmentally triggered responses to the human body.

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Each speaker's presentation will last approximately 20 minutes and will be followed by a 10 minute question and answer session. All speakers are encouraged to use any and all appropriate audio/visual aids. (A brief outline of the speech is included in this booklet.)

Every afternoon, we will have a case study/panel discussion. This session will consist of various faculty members discussing real cases. The audience is encouraged to participate in these discussions.

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IMPLANTS

A Public Conference

Sponsored By:

American Environmental Health Foundation

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Guest Speakers:

Deborah Baird, M.D. - Pediatrician
"TMJ IMPLANT SYNDROME; IT'S NOT ALL IN YOUR HEAD"

Arthur D. Ericsson, M.D. - Neurologist
"SYNDROMES ASSOCIATED WITH SILICONE BREAST IMPLANTS"

James Key, M.D. - Orthopedic Surgeon
"ORTHOPEDIC IMPLANTS"

William J. Rea, M.D. - Cardiovascular Surgeon
"OVERVIEW OF THE IMPLANT SYNDROMES: BREAST, VASCULAR, ABDOMINAL, EYES, PACEMAKER, TREATMENT POST REMOVAL"

Sherry Rogers, M.D.
"The Causes and Cures of Breast Cancer"

Larry Wolford, D.D.S.
"LOCAL AND SYSTEMIC EFFECTS OF PROPLAST / TEFLON IMPLANTS TO THE TMJ"

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Saturday, February 22, 1997
The Le Meridien Hotel - Dallas (Cambridge Room)

1997 SYMPOSIUM FACULTY

Jacques Benveniste, M.D.
I.N.S.E.R.M. U 200
32 Rue Des Carnets
92140 Clamart
France

Phone: 011 33 1 46 32 12 07
Fax: 011 33 1 46 31 02 77

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Joel R. Butler, Ph.D.
Environmental Health Psychologists
P.O. Box 399
Dewey, OK 74029

Phone: 918/534-0190
Fax: 918/534-1071

General Information:
- Received doctorate in clinical psychology from Louisiana State University, Baton Rouge, Jan. 1962. Served as Professor LSU Baton Rouge; University of Georgia, Athens; Virginia Commonwealth University, Richmond, (Clinical Director); University of North Texas, Denton (Professor and Chair--Retired).

Additional Information:
- Published/presented over 100 professional papers and contributor/author to 10 books.

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Nancy A. Didriksen, Ph.D.
Health Psychology Behavioral
Medicine Associates
100 N. Cottonwood Dr., Suite 106
Richardson, TX 75080

Phone: 972/889-9933
Fax: 972/889-9935

Dr. Didriksen received her degree in health Psychology/Behavioral Medicine from the University of North Texas in 1986. She completed her clinical internship in the Environmental Control Unit at Northeast Community Hospital in Bedford, Texas and has been evaluating and treating environmentally sensitive patients since that time.

She has given many presentations and has published on the psychological aspects of environmental illness and is the first author of a chapter titled Psychological Concomitants of Chemical Sensitivity: Evaluation and Treatment in Dr. William J. Rea's Vol. 4, *Chemical Sensitivity*. She is an adjunct professor of psychology at the University of North Texas. Current research is the investigation of various aspects of neuropsychological dysfunction in chemically sensitive individuals.

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Roy A. Fox, M.D.
Environmental Health Center
P.O. Box 2130
Fall River, Nova Scotia B2T 1K6
Canada

Phone: 902/860-0057
Fax: 902/861-1914

His topics include:

EMF Sensitivity in workers in a hospital with IAQ problems and

Heightened Sensitivity Syndrome.

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Susan F. Franks
University of North Texas Health Science Center
3500 Camp Bowie Blvd.
Department of Psychiatry
Ft. Worth, TX 76107

Phone: 817/735-2334
Fax: 817/735-2299

General Information:

- Dr.Franks received her Ph.D. in Health Psychology & Behavioral Medicine in 1992 from the University of North Texas. She is currently an Assistant Professor in the Dept. of Psychiatry at UNT Health Science Ctr where she is the Director of Neuro-psychological Services and Departmental Director of Research.

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Bertie Griffiths, Ph.D.
Environmental Health Center - Dallas
8345 Walnut Hill Lane, Suite 205
Dallas, TX 75231

Phone: 214/368-4132
Fax: 214/691-8432

General Information:

- Graduate of the University of Wisconsin and the University of the West Indies, Faculty of Medicine.
- Recipient of :
  1. Degrees in microbiology, virology, and post-doctoral training in Infectious Diseases and Immunology
  2. Rockefeller fellowship to study Entomology and Virus epidemiology in Brazil and Trinidad.
- Appointments:
  - Professor and Consultant in Microbiology and Infectious Diseases.
  - Presently - Director of EHC-D Analytical Laboratory

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Russell Jaffe, M. D., Ph.D.
Serammune Physicians Lab
1890 Preston White Dr.
Reston VA 20191

Phone: 703/758-0610
Fax: 703/758-0615

General Information: (Education, Specialties, etc.)
- 1972 graduated from Boston University, with a Ph.D. in Biochemistry and his M.D.
- 1972-1973 medical internship University Hospital in Boston
- 1973-1975 residency at Clinical Pathology, National Institutes of Health in Maryland
- He is Board Certified in Pathology and the National Board of Medical Examiners
- 1996 he was awarded Who's Who in Medicine and Healthcare and the POZ 50 Most Innovative AIDS Researchers.

Additional Information:
-Written a number of books and articles

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Wayne Jonas, M.D.
Director of Alternative Medicine
National Institute of Health
9000 Rockville Pike
Bethesda, MD 20892

Phone: 301/594-1990
301/402-2466
Fax: 301/402-4741

General Information: (Education, Specialties, etc.,.)
Dr. Jonas was born in Twin Falls, Idaho. He received his Bachelor of Arts degree from Davidson College in Davidson, NC, and his M.D. from Bowman Gray School of Medicine in Winston-Salem, NC.

Dr. Jonas assumed responsibility of the OAM in July 1995. The OAM was established at the NTH in 1992 to evaluate and investigate complementary, alternative, and unconventional medical practices using appropriate , high quality scientific methods; to coordinate and facilitate research training activities in complementary, alternative, and unconventional medical areas; and to disseminate that information to the public.

Previously, Dr. Jonas served as the Medical Research Fellowship at Walter Reed Army Institute of Research, Washington, D.C.

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Alfred R. Johnson, D.O.
Environmental Health Center - Dallas
8345 Walnut Hill Lane, Suite 205
Dallas, TX 75231

Phone: 214/368-4132
Fax: 214/691-8432

General Information:
- Graduate of William Jewell College in Liberty, MO, Received his Doctor of Osteopathic Alfred Medicine at the Univ. Of Health Sciences Center in Kansas City, MO.
- Dr. Johnson has served a six-year term on the Texas State Board of Medical Examiners
- A fellow and former board member of the American Academy of Environmental Medicine, a member of the American College of Osteopathic Internists, the Joint Council of Allergy and Immunology, the Pan American Allergy Society , the American Academy of Disability Evaluating Physicians (fellow), the American Osteopathic Association and the Texas Osteopathic Association. He also holds memberships with American Public Health Association, the American College of Allergists and the American College of Allergy and Immunology.

Other:
- has published numerous research studies which include topics related to immune system function and examining the health effects of environmental factors on the human body.

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Prof. Dr. med. D.G.S. Thilo-Korner
Euro-Med-Clinic
Europa-Allee 1
90763 Furth

Phone: 09 11/97 14-5 31
Fax: 11/49-91-19-71-45-32

General Information:

21.08. 1945	Born in Erlangen /FRG
1951-1965	Elementary & High School, Erlangen
1963-1964	Exchange Student, Homer/N.Y./USA High School Graduate Diploma
1965-1971	University of Erlangen: medicine, psychology
1968-1969	research scholarship from the Faculty of Medicine, University of Erlangen to the University of Colorado /Denver/USA, Prof. Dr. K.N. von Kaulla

1970 Finishing medical thesis in Denver 1971 Graduation from University of Erlangen
1972 Physician at I. Medical University Hospital, University of Munich 1974 Married Gabriele
1984 Election to "Hochschulassistent" 1990 Visiting Professor at the University of Rabatt, Morocco
1994 head of Department of Internal Medicine, Department of Complementary Medicine; Euro-Med-Clinic, Furth /Germany Other: 4 - Books, 152 - Scientific Papers, 354 - Oral Presentations

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Rollin McCraty
Institute of Heart Math
14700 West Park Avenue
Boulder Creek, CA 95006

Phone: 408/338-8727
Fax: 408/338-1182

General Information: (Education, Specialties, etc.,.)
-The Institute of HeartMath is a nonprofit research and educational organization.
-The Institute 's research has laid the foundation for the development of new interventions which enhance human performance and promote physical, mental and emotional well-being.
-Mr. McCraty has an extensive background in systems engineering, radiational physics and instrumentation design which he has brought to the study of human electrophysiology.
-Mr. McCraty has authored a number of scientific papers on heart rate variability, coherent bioelectromagnetic fields and the effects of stress management interventions on human physiology.

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Kenneth J. McLeod, Ph.D.
State University of New York at Stony Brook
Dept. Orthopedics
H.S.C. T-18 Room 030
Stony Brook, NY 11790-8181

Phone: 516/444-2215
Fax: 516/444-7671

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Professor Gavril Markarov
Chief Rehab. Dept.
Hospital 83 Federal Department Med. Biol.
Extreme Problem M. H. Russia
Lipetskaya Str. 13, Apt. 47
Moscow 115598
Russia

Phone: 095 329 3555
Fax: 095 395 6377

General Information: (Education, Specialties, etc.,.)
Twenty years of Magnetolaser treatment of humans in rehabilitation of cardiologies, phlebologies, traumatic, rheumatic, neurologic patients. Twelve years in rehabilitation of radiation exposed patients, EMF Hypersensitivity Neurasthenia Patients by weak EMF, balneotherapy. Seven years of work on bio controlled EMF - chromotherapy of the brain, heart bioelectrical activity, hemodynamics disorder in hypertonic, Parkinson, allergic patients.

1995- present 2nd Professor of Biophys, Dep. Gover. Med. Univer. Moscow
1986- present Chief of Rehab., Physiother. Dep., 83 Hosp., Federal Dep. Med. Bio. Extrem.
1978-1986 Head of Pysiother. Dep., Physiotherapy Hospital. Moscow

****

William J. Meggs, M.D., Ph.D.
E. Caroline School of Medicine
103 Hidden Hills Drive
Greenville, NC 27858-8635

Phone: 919/816-2954
Fax: 919/816-3589

- Ph.D. in Theoretical Physics, Syracuse University
- M.D. University of Miami
- Medical Staff Fellowship, National Institutes of Health, Fellowship in Medical Toxicology, Bellevue Hospital and New York City Poison Center

Additional Information:
- Co-Author of Biomarkers of Immunotoxicology, National Academy of Sciences, Contributor to Multiple Chemical Sensitivities, National Academy of Sciences, Co-Editor of Health and Safety in Agriculture, Forestry, and Fisheries.

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Jean Monro, M.D.
Breakspear Hospital
Hempel Hempstead
Hertfordshire HP3 9XL England

Phone: 011 44 2616 1333
Fax: 011 44 4426 6388

- Dr. Monro is a Fellow of the American Academy of Environmental Medicine, A Diplomate of the International Board of Environmental Medicine, and a member of the American College of Occupational and Environmental Medicine. She is also an Associate of the British Society of Occupational Medicine and a member of the British Society for Allergy and Environmental Medicine.
- Dr. Monro is a Consultant Physician in Environmental Medicine appointed to Fachkrankenhaus Nordfriesland Schleswig-Holstein in a neurotoxische Ambulanz dealing with clinical neurotoxicology. This German hospital is establishing an environmental unit.
- She has a background in hospital geriatric medicine and worked at the National Hospital for Nervous Diseases, Queen Square, London, researching migraine and multiple sclerosis. She entered full time practice in Environmental Medicine in 1982 and in 1988 established the Breakspear Hospital for Allergy and Environmental Medicine.
- She has many publications to her name and is a regular faculty member at AAEM meetings. Her primary areas of interest are functional medicine and detoxifying enzyme pathways.

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Tatsuto Namba, M.D.
School of Medicine, Kitasato University
1-51-1 Kitasato, Sagamihara, Kanagawa 228, Japan

Phone: 81-427-78-8464
Fax: 81-427-78-2357

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