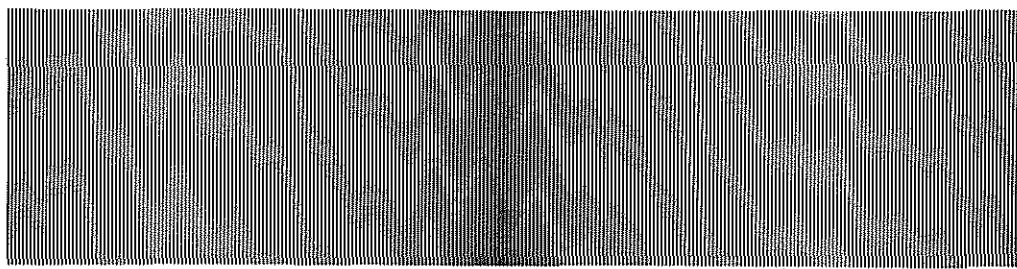


MICRO WAVE NEWS



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Yannon Decision Upheld; NY Telephone To Appeal Again

A New York court has upheld a workers' compensation award to Samuel Yannon's widow. In a May 6 decision, the State Supreme Court Appellate Division found sufficient evidence to link the New York Telephone Company technician's death to microwave radiation exposure. The action affirms previous rulings from an administrative law judge and a 1981 appeal before a state Workers' Compensation Board. New York Telephone is now requesting another appeal.

The case, brought by Mrs. Nettie Yannon in 1975, is the first establishing chronic exposure to microwave radiation as a cause of death. Yannon spent 15 years adjusting microwave relay equipment for the phone company on the 87th floor of the Empire State Building before being terminated for medical reasons in 1970. Yannon died four years later from what his doctor diagnosed as "chronic brain syndrome with psychotic overtones due to biological brain changes resulting from prolonged exposure to short wave radiation." (See *MWN*, April 1981.)

In its unanimous decision, the appellate division court concludes that there was "substantial evidence to establish the necessary causal relationship" between Yannon's exposure and the development of an occupational disease ending in his death. Addressing New York Telephone's contention that there is no evidence of unsafe radiation levels, the opinion states that data on Yannon's exposure are not available and that "the present state of scientific knowledge has not advanced to the point where exactitude exists in fixing the limits of microwave radiation on the human body." (See page 2 for full text.)

Charles Herndon from the New York Telephone's legal department announced that the company will seek an appeal but would not comment on the

(continued p. 2)

Radiation Control Officials Meet

A new task force has been set up within the Conference of Radiation Control Program Directors to investigate model state regulations for non-ionizing radiation. Word of the new effort came at the conference's 14th annual meeting in Portland, ME, during the week of May 24.

Among the other items disclosed at the meeting were:

- The Bureau of Radiological Health (BRH) intends to investigate the possible effects of ultrasound on the fetus, according to BRH Director John Villforth. He said that about 60 percent of all deliveries now use ultrasound to diagnose abnormalities. Potential risks include increased fetal activity, delayed neural motor response and reduced birth weight.

- Villforth noted that BRH is having problems publishing technical reports due to budgetary pressures.

- BRH's William Herman reviewed the control of radiation from RF sealers. He said that the machines, though operating in the 27 MHz band, give off "parasitic" radiation at higher frequencies. Interestingly, in some cases these harmonic signals have been found to be stronger than the fundamental

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Yannon Appeal Decision (continued from p. 1)

case while it is before the court. The phone company has maintained that Yannon suffered from pre-senile dementia, probably Alzheimer's disease.

Because the decision is unanimous, the phone company must seek permission from the appellate division to take the case to the Court of Appeals, the state's highest court. Angelo Gucciardo, the New York City lawyer handling Mrs. Yannon's case, does not think there are grounds for another review.

After the February 26, 1981, compensation board appeal ruling, Mrs. Yannon received \$29,000 in retroactive benefits from the phone company and an award of \$45 per week for life or until she remarries.

Pleased with the recent decision, Mrs. Yannon said, "This has been a long ordeal, but at last my husband's disease will be on the books as an occupational problem."

A second suit brought by Mrs. Yannon against RCA, the manufacturer of the relay equipment her husband used, is still in its early stages. Filed in 1976 in the New York State Supreme Court, Richmond County, the \$3.5 million action charges RCA with breach of warranty and negligence.

Text of Appeal Decision

Claimant is the widow of Samuel Yannon, a former employee of the New York Telephone Company, who died on June 10, 1974. From 1955 until the early part of 1968, decedent was a radio technician assigned to a special service unit which monitored and repaired microwave transmission units at the employer's Television Transmission Facility located on the 87th floor of the Empire State Building. Except for rare occasions when decedent worked on units in the field, he worked exclusively at this facility on a daily basis, with considerable overtime. The tenure of his co-workers generally did not exceed three years.

There were 25 microwave units at the facility, spaced about five feet apart, each with its parabolic reflecting dish facing the outer glass wall of the building. Protruding from the center of each reflecting dish was a "feedhorn" antenna from which microwave transmissions could be beamed out to or received from other locations. Behind the center of each dish, enclosed in a housing, was a klystron tube, which was the power source of the unit that emitted the microwave transmissions. Among decedent's duties was the tuning, repairing and aligning of these microwave units. Access to the "feedhorn" antennas was by means of a "walkable area" between the glass wall of the building and the parabolic reflecting dishes, while the klystron tubes could be reached from the interior console area. The tuning process was performed two or three times each day and required approximately 20 minutes on each occasion. The tube emitted microwaves as it was tuned, while the antenna was supposed to be turned off during such adjustments. One of the crucial questions presented, and one which resulted in conflicting views, was the amount of microwave radiation to which decedent was exposed; whether it exceeded permissible standards and whether those standards themselves are within acceptable levels.

Prior to 1968 decedent's health was good. However, early that year, at the age of 57, he began to suffer a drastic deterioration of his hearing, sight and coordination to such an extent that he was unable to perform his duties, requiring his placement on disability leave. He was retired on July 7, 1971, and died three years later after a prolonged period of progressive physical and mental deterioration. The hospital records where decedent was confined indicate that he suffered from an "organic brain syndrome" or a "degenerative central nervous system disease" or a "chronic brain syndrome" of unknown etiology. There were, however, references in the record, by attending physicians, that decedent's symptomatology could be related to microwave exposure. On January 11, 1975, the claimant widow filed her claim for death benefits, contending that decedent's death resulted from his exposure to microwave radiation.

The testimony at the numerous workers' compensation hearings, both lay and expert, was lengthy and conflicting. The Administrative Law Judge awarded claimant benefits and the board affirmed, finding that decedent's death resulted from an occupational radiation disease, one within the meaning of section 3 (subd. 2, par. 30) of the Workers' Compensation Law, and that said disease and his ultimate death were directly related to his exposure to microwave radiation while employed by the New York Telephone Company.

On this appeal, we must first consider whether the record demonstrates the existence of a recognizable occupational disease identified as "microwave radiation sickness" and, if so, whether decedent was so afflicted. In order to be so identified, such a disease must actually be caused by the employment and from the particular work the employee is performing. It must result from the nature of the employment and as a natural incident thereof (*Matter of Goldberg v. 954 Marcy Corp.*, 276 N.Y. 313). It cannot be founded upon the aggravation of a pre-existing condition which is not occupational in nature. In other words, "there must be a recognizable link between the disease and some distinctive feature of the claimant's job" (*Matter of Detenbeck v. General Motors Corp.*, 309 N.Y. 558).

Claimant's leading expert, Dr. Milton Zaret, provided the board with ample evidence of the existence of a disease identified as "microwave or radiowave sickness." Dr. Zaret's own studies, including those performed for the United States Government, and excerpts of reports from the Warsaw Conference of 1973 which documented the diagnosis of such a disease in other countries, substantiate this conclusion. The board was entitled to credit his testimony and that of other experts supporting this view.

Whether claimant was so afflicted with this disease presents a more difficult question. The employer's experts, also eminently qualified, steadfastly maintained that decedent suffered from Alzheimer's disease which caused pre-senile dementia, retinitis pigmentosa and generalized arteriosclerosis. This conclusion also finds ample support in the record. However, our review is limited to whether there is substantial evidence in the record to support the board's decision, not whether upon this record the court would have come to a different conclusion (*Matter of Palermo v. Gallucci & Sons*, 5 N.Y. 2d 529).

The requisite proof that decedent's death was causally related to exposure to microwave radiation during the course of employment presents another troublesome issue. The employer contends that there is no evidence of exposure to unsafe levels of radiation. However, the accuracy of the measurements of radiation taken by the employer is in issue, as well as the number of microwave units in operation when measurements were taken. Moreover, there was expert testimony that even at permissible levels, exposure over a prolonged period of time could produce long-term harmful effects. Here, the exact proof of the amount of radiation to which decedent was exposed is not available (see *Matter of Murphy v. Beaunit Fibers*, 42 A.D.2d 1009). However, the present state of scientific knowledge has not advanced to the point where exactitude exists in fixing the limits of microwave radiation on the human body. This does not mean that the testimony of recognized experts should be rejected where their views are supported by a record that presents arguable issues as to the degree of radiation, as long as there is substantial evidence to support these views after a study of all the salient material available (*Matter of Besner v. Kiddie Nuclear Lab.*, 24 A.D.2d 1045; *Matter of Matthews v. General Elec. Co.*, 2 A.D.2d 623; *Matter of Zaepfel v. du Pont de Nemours & Co., Inc.*, 284 App. Div. 693, affd. 309 N.Y. 962).

Finally, upon the entire record and with the assistance provided by the applicable presumption, we conclude that there is substantial evidence to establish the necessary causal relationship between decedent's exposure to microwave radiation, the development of the within [sic] occupational disease and his ultimate death (Workers' Compensation Law, § 47; *Matter of Lapinsky v. Ardom Bake Shop*, 18 A.D.2d 850, affd. 13 N.Y. 2d 1163). While the hospital records indicate preliminary conclusions that decedent's condition was idiopathic, the record, as developed, supports the board's decisions.

The decisions should be affirmed, with costs to the Workers' Compensation Board.

Opinion per Kane, J.
Mahoney, P.J., Sweeney, Casey and Mikoll, JJ., concur.

State of New York Supreme Court
Appellate Division, Third Judicial Department

May 6, 1982

BOOK REVIEWS

Robert O. Becker and Andrew A. Marino, *Electromagnetism and Life*. Albany, NY: State University of New York Press, 1982, 211 pp., \$33.50 (hardcover), \$10.95 (paper).

Becker and Marino present a comprehensive review of the influence of electromagnetic fields (EMFs) on living systems. Beginning with an overview of the scientific and political history of bioelectrical phenomena, they go on to discuss what is known about intrinsic and natural EMFs, and the effects of man-made EMFs on the nervous, endocrine, cardiovascular, hematological, immune and reproductive systems.

The authors, well known for their work on regeneration, develop the hypotheses that intrinsic EMFs control biological functions, while natural EMFs convey information to living organisms. Artificial fields, meanwhile, act as stressors—stimuli that elicit a common physiological, adaptive response. In this well-referenced book, Becker and Marino argue that “the present abnormal electromagnetic environment can constitute a health risk.”

Arthur D. Bloom, ed., *Guidelines for Studies of Human Populations Exposed to Mutagenic and Reproductive Hazards*. White Plains, NY: March of Dimes Birth Defects Foundation, 1981, 163 pp., \$10.00.

In 1980, people living near Love Canal were driven into a frenzy as scientists argued about the validity of a study that showed that they had an increased incidence of damaged chromosomes. The study turned out to be a dud. In an effort to avoid future confusion, a conference was organized to set up some guidelines on how to do such investigations. This volume is the product of that meeting.

Today, at a time when a number of clusters of birth defects and miscarriages have been reported among VDT operators, there is growing anxiety about what in fact constitutes a significant grouping of adverse effects. This book could serve as a tutorial for those uninitiated in epidemiological research. One chapter, “Guidelines for Reproductive Studies in Exposed Human Populations,” is especially useful: it explains, in simple English, the different types of studies, the “normal” incidence rates for major malformations, the statistics of sample size and many other key issues.

Lowell L. Klessig and Victor L. Strite, *The ELF Odyssey: National Security Versus Environmental Protection*. Boulder, CO: Westview Press, 1980, 310 pp., \$27.75.

Klessig and Strite use the history of the Navy’s proposed ELF communications system for sending messages to submerged submarines as a case study of citizen action. The book provides an interesting and

clearly written account of the massive antenna system’s evolution and the stormy politics surrounding it. Successively known as Sanguine, Seafarer and finally ELF, the project has met strong opposition on ecological grounds in proposed host states since 1968.

The authors maintain that “the ELF experience is an example of the bewildering technology and mammoth bureaucracy that threaten to obliterate democratic decision-making.” Advocating citizen involvement, they use ELF to show how government functions and how the public can influence its decisions.

John N. Ott, *Light, Radiation & You*. Old Greenwich, CT: Devin-Adair, 1982, 174 pp., \$14.50.

Those who have read Ott’s previous book, *Health and Light*, will find themselves on familiar ground. Ott announces his objective at the outset: he wants to take decisions about lighting away from the janitor and place them firmly “under scientific control.” He cites examples of what he calls malillumination (exposure to light which has biologically important wavelengths missing), the potentiating effects of visible radiation on drugs, hyperactivity caused by fluorescent lights and the healing power of full spectrum light. One intriguing hypothesis is that fetal monitoring equipment can weaken muscles, thus forcing a Caesarian birth.

Some readers may be put off by Ott’s chatty and anecdotal style, and there is much here that probably will not stand up to the rigors of the scientific method. But Ott is no doubt correct in his view that specific wavelengths have specific biological functions and that these will soon be the subject of greater experimental scrutiny.

Ronald T. Pretty, ed., *Jane’s Weapon Systems, 1981–82*. 12th edition, 1006 pp., \$140.00.

R.J. Raggett, ed., *Jane’s Military Communications, 1981*. 2nd edition, 629 pp., \$125.00.

Both volumes are published in the US by Jane’s Publishing, Inc., New York, NY, and distributed by Franklin Watts, Inc., New York, NY.

These are extraordinary reference books. They are indispensable to anyone trying to sort out the different kinds of military radar and communications systems now in use all over the world. Each system is described in detail, including operating characteristics (such as frequency, power and waveform), use, manufacturer and history. The indexes make it easy to find any listing, and both volumes are profusely illustrated.

Radiation Directors (continued from p. 1)

at 27 MHz. A possible explanation is that the fundamental may be better controlled inside the machine. It adds up to a “very tricky” measurement problem, Herman said. He also reported that the National Institute for Occupational Safety and Health (NIOSH) had found average exposures of 591 V/m at the operators’ necks and 1.04 A/m at their chests. The highest readings were 2500 V/m and 13 A/m.

- The Environmental Protection Agency has sponsored a study, *Identification of Potential Human Study Populations for Non-Ionizing Radiation Health Effects*, to help in future epidemiological research. The contractor, JRB Associates of McLean, VA, pinpointed eight such groups and outlined the pros and cons of each. The study is now being peer reviewed.

- NIOSH’s William Murray said that the agency had not yet been able to set up an epidemiology of RF sealer workers.

- Robert Watkins of Massachusetts’ radiation control program explained the state’s reasoning for deriving public exposure standards from occupational standards. He said that they had considered a factor of ten but had found that it

would have too great an impact, and had therefore settled on a factor of five. The state will soon propose a frequency-dependent population standard of 200 uW/cm², at its most stringent level. (See *MWN*, March 1982.)

The new task force on model state standards, chaired by Robert Hallisey of the radiation control program at the Massachusetts Department of Public Health, is the radiation control directors’ third group dealing with non-ionizing radiation. This new effort complements the radiation directors’ on-going work on model standards for laser safety. Charles Tedford of the Arizona Radiation Regulatory Agency heads one on measurement and instrumentation, and Lawrence McDonnell of the Wisconsin Department of Health and Social Services is in charge of a group that is studying setting priorities for radiation-emitting consumer products.

Some 325 radiation officials from 49 states attended the meeting. Only the radiation director from Idaho was unable to come to Maine because of restrictions on out of state travel. The briefing on RF sealers was requested by a number of states including Vermont, which asked for assistance in evaluating RF hazards.

ASME Decision: Impact on Voluntary Standard Setting Committees

In a decision that could have wide ranging impact on all voluntary standard setting organizations, the United States Supreme Court has ruled that the American Society of Mechanical Engineers (ASME) is liable for the actions of its committee members. The Supreme Court supported a lower court's finding that the ASME had violated the antitrust laws when a member of one of its technical committees had "successfully used his position within the ASME in an effort to thwart" a competitive challenge.

The case was brought by Hydrolevel Corp., which began competing with McDonnell & Miller, Inc., (M&M) for a share of the market for water boiler safety devices in the 1960's. Members of a subcommittee of the ASME's Boiler and Pressure Vessel Committee worked with M&M executives to discourage customers from buying Hydrolevel's product. Hydrolevel eventually went out of business and all the parties to its suit alleging violation of the antitrust laws settled except for the ASME.

Under the court's ruling, the society is now liable for treble damages under the Sherman Act. The district court entered a judgment against ASME of more than \$7 million; whether this amount will in fact be awarded will be decided later. The ASME has some 90,000 members and an annual budget of approximately \$12 million a year.

The ruling has caused a chill within voluntary standard setting organizations. Most of the standards dealing with non-ionizing radiation are set by such bodies. Whether the decision would affect committee work on health and safety is not clear at this time. A number of experts contacted by *Micro-wave News* thought that the impact would be determined by future litigation.

Eric Herz, the executive director and general manager of the Institute of Electrical and Electronic Engineers (IEEE), expressed "serious hope that we can do things in such a way that we do not discourage volunteer participation." He said that the IEEE would review its procedures in order to see if improvements were needed.

William Rockwell, legal counsel for the American National Standards Institute (ANSI), issued a statement which read in part: "It is clearly evident that the Hydrolevel case is not an indictment of voluntary standards development or accreditation. It is confined to the question of the authority of volunteer committee participants to interpret a standard and the liability of the developing group for such actions." He went on to note that ANSI has already revised its procedures to prevent such cases.

Justice Harry Blackmun wrote the majority decision for a divided court. He concluded:

When ASME's agents act in its name, they are able to affect the lives of large numbers of people and the competitive fortunes of businesses throughout the country. By holding ASME liable under the antitrust laws for the antitrust violations of its agents committed with apparent authority, we recognize the important role of ASME and its agents in the economy, and we help to ensure that standard-setting organizations will act with care when they permit their agents to speak for them.

The six-to-three decision in *American Society of Mechanical Engineers, Inc., v. Hydrolevel Corp.* was issued on May 17.

Multnomah County Delays Standard

Multnomah County, OR, has delayed adopting a radiofrequency/microwave exposure standard. The County Board of Commissioners decided not to approve a draft ordinance setting criteria for siting broadcast antennas in unincorporated Multnomah, next to Portland, because of concern over potential health hazards. To avoid placing new transmission towers in urban areas, allowed under the proposed rules, the board has suggested creating an antenna farm in the undeveloped Dixie Mountain area.

The draft ordinance submitted to the board last month by the county planning commission would have set exposure limits at 200 $\mu\text{W}/\text{cm}^2$ for 30-300 MHz, rising to 1 mW/cm^2 for frequencies above 1500 MHz and to 20 mW/cm^2 for those below 3 MHz. New broadcasters would have been required to share towers because of a lack of suitable locations and an anticipated increase in demand for transmitters.

According to Larry Epstein of the commission staff, by clustering sources only two new towers would be needed in the next five to ten years. Epstein said putting towers on Dixie Mountain could cause transmission losses that would be expensive to overcome. The Federal Aviation Administration has declared that the site would pose hazardous radiofrequency interference problems for aircraft.

The planning commission must now expand its six-month effort to develop a standard that can win board approval. In the interim, the county is continuing its moratorium on applications for new facilities. The freeze was imposed last December when the county decided to commission studies on the environmental impact of transmission towers. (See *MWN*, January/February 1982.) The board has scheduled hearings for June 8 and 15.

Swedish Physiotherapists: Pregnancy Study

An epidemiology of female physiotherapists suggests that exposure to non-ionizing radiation during pregnancy can increase the incidence of malformations and fetal death. The statistical finding is only "borderline," according to the researchers; they warn that it may only be a random phenomenon.

Dr. Bengt Kallen and Gert Malmquist of the Department of Embryology and Dr. Ulrich Moritz of the Department of Physical Therapy at the University of Lund in Sweden reviewed the histories of 2,043 infants born to 2,018 women between 1973 and 1978. Then they studied the 37 women who had seriously malformed or perinatally dead infants, investigating their use of X-ray, shortwave, microwave, ultrasound and electrostimulator equipment during pregnancy.

While as a group the women had fewer problem pregnancies than statistically expected, the researchers did find that "there are indications of a higher degree of shortwave use (and perhaps of ultrasonic waves also) among those females who gave birth to a malformed or perinatally dead infant." No data on radiation exposure were available, nor was it possible to separate exposure to ultrasound from shortwave radiation. Microwaves were used so rarely that no inferences on their potential hazard could be drawn.

Writing in the March/April *Archives of Environmental Health*, the Swedish team notes the possibility that "repeated exposure to non-ionizing radiation in the form of shortwaves (and perhaps also microwaves) could slightly increase the risk

for fetal damage," but that "it is difficult to reject, without further discussion, the finding as a random phenomenon."

Congress: Glenn Bill, RFI and Radio Marti

The subcommittee on energy, nuclear proliferation and government processes of the Senate Committee on Governmental Affairs held hearings on Senator John Glenn's (D-OH) Federal Radiation Protection Act of 1982 (S. 2284) on April 29. The bill would set up a Federal Council on Radiation Protection and a Federal Conference on Research Into the Biological Effects of Radiation to coordinate regulation and research respectively. (See *MWN*, May 1982.)

Witnesses were split on the merits of the proposal. For instance, the General Accounting Office's J. Dexter Peach supported the measure while Assistant Secretary for Health Dr. Edward Brandt spoke against it. Some, like Robert Minogue of the Nuclear Regulatory Commission, thought that the present Interagency Radiation Research Committee could effectively deal with the proposed conference's mandate. In his comments supporting the bill, Warren Sinclair of the National Council on Radiation Protection and Measurements asked that the scope of the proposed council and conference include non-ionizing radiation.

Both the chairman of the subcommittee and the committee have been asked to schedule a mark up for the bill. No response has yet been received.

The Communications Technical Amendments Act of 1982 (H.R. 5008) was reported out of the House subcommittee on telecommunications, consumer protection and finance on May 5. An amendment was approved that authorizes the Federal Communications Commission to set "minimum performance standards for audio and visual electronic equipment to reduce their susceptibility to interference from radio-frequency energy." Parallel language is contained in Senator Barry Goldwater's (R-AZ) bill (S. 929). The measure was scheduled to go before the Committee on Energy and Commerce on May 27, but was delayed until early June.

The telecommunications subcommittee held hearings on Radio Marti on May 10. On May 20, the subcommittee voted to prohibit the Reagan Administration from using AM frequencies for broadcasting information to Cuba. If this is approved by the full committee, Radio Marti would have to use shortwave frequencies.

Satcom Stations Booming in New York

Work will soon begin on three major satellite communication stations in the New York City metropolitan area. Home Box Office (HBO) has won approval for its station in Smithtown on Long Island. The City Planning Commission is expected to act favorably on an application by Hughes Aircraft to build the first station of its new Galaxy communication system in the Spring Creek section of Brooklyn. And a joint venture between the Port Authority of New York and New Jersey (PA) and Merrill Lynch to develop a huge "Teleport" complex in Staten Island is in the process of assembling the necessary approvals.

The PA-Merrill Lynch plan is by far the most ambitious, calling for at least ten receive and transmit antennas on a 350-acre site on Staten Island, with connections via a fiber optic cable to Jersey City, NJ, and the World Trade Center in downtown Manhattan. The complex will have the capability to communicate with all satellites in the Northern Hemisphere's orbital arc. The legal details of the "partnership" between Merrill Lynch and the PA are in the process of being negotiated.

Merrill Lynch's Stanley Welland predicted that the satellite antenna farm would serve a wide range of clients including broadcast networks, cable TV, banks, and financial institutions. Joseph Milano of the PA said that construction on Staten Island could begin as early as late this summer, with services beginning next year. Expansion would continue over the next decade.

Representatives of Hughes Aircraft presented their case for the first station in their new domestic communication network at a hearing before the New York City Planning Commission on May 19. According to the environmental impact statement, the maximum public exposure would be 1-2 $\mu\text{W}/\text{cm}^2$ at the property line. (See *MWN*, April 1982.) Peter Berle, an attorney and the former head of the state's Department of Environmental Conservation, called his client's review "the most comprehensive analysis that has ever been done." He said that the radiation levels would be "far below any known standard."

Speaking for the city's Public Development Corp., Jed Marcus said that "any neighborhood would be proud of the Hughes project." Commission approval is expected in June. Hughes only needs permission from the city's Board of Estimate before construction can begin.

The Smithtown Board of Zoning Appeals approved the building of up to seven 45-foot antennas for HBO in Suffolk County, Long Island, on February 11. The site will be connected to the Gulf + Western building in midtown Manhattan by a combination of microwave line-of-sight and cable relays. John Rosenblum of Telspec in Hauppauge, NY, said that his radiation analysis indicated that the maximum radiation exposure, estimated on a worst case basis, would be 10.9 $\mu\text{W}/\text{cm}^2$ at the HBO property line. The board hired John Baum of Brookhaven National Laboratory to review the HBO application.

The cable entertainment company had originally planned to build the station in Rockaway, NJ, but gave up in the face of strong community opposition. (See *MWN*, January 1981.) Scientific Atlanta is expected to build the station for HBO.

IRPA Occupational Exposure Guideline

The International Non-Ionizing Radiation Committee of the International Radiation Protection Association (IRPA) is circulating a review draft of its occupational exposure standard for 100 kHz to 300 GHz radiation. The frequency-dependent guideline proposes a 1 mW/cm^2 limit for exposure to 10 MHz-1 GHz radiation and recommends up to a tenfold additional safety factor for general population exposures. The committee also recommends that "under all circumstances exposures should be kept as low as readily achievable."

In the other frequency ranges, the proposed levels are: 25 mW/cm^2 for 100 kHz-1 MHz; 10 mW/cm^2 for 1 MHz-10 MHz; and 5 mW/cm^2 for 1 GHz-300 GHz. For all frequencies, a six-minute averaging time for measuring exposures is suggested.

The IRPA guideline closely parallels the new ANSI standard, except that the exposure limit for different frequency bands changes as a step function rather than as a continuous function of frequency. The draft claims the step approach is "more desirable from a compliance viewpoint."

No recommendation is made for a peak power limit for radiation with a pulse width on the order of milliseconds or less. The committee does advise, however, that "pulsed repetition rates at extremely low frequencies (8-16 Hz) and intermittent exposures repeated with the same frequencies should be avoided."

UPDATES

Biological Effects . . . Dr. Joe Elder of EPA's Environmental Biology Division reports that he has received four reviews of Dr. William Morton's study, which found a correlation between three types of cancer and RF/MW radiation among residents of Portland, OR. (See *MWN*, January/February and May 1982.) On the basis of these reviews, Elder has asked Morton to "extensively revise" and resubmit his study. No new timetable has yet been worked out. Elder refused to comment on the study itself . . . A new draft of EPA's health effects document, *Biological Effects of Radiofrequency Radiation*, will be ready for review by the agency's Scientific Advisory Board (SAB) this summer. As soon as it goes to the SAB, it will be available to the public. The document will be the basis for EPA's "guidance," or recommended safety level, for public exposures to RF/MW radiation. The formal notice of an intent to issue a guidance is still waiting for Administrator Anne Gorsuch's approval . . . The papers presented at the *Festschrift* for Professor Herman Schwan, held in November 1980, have been published in Volume 3, Number 1 of *Bioelectromagnetics*. The collection, *The Interaction of Acoustical and Electromagnetic Fields with Biological Systems*, edited by Shiro Takashima and Elliot Postow, is also available as Volume 86 of *Progress in Clinical and Biological Research* for \$28 from Alan R. Liss, Inc., 150 Fifth Avenue, New York, NY 10011 . . . EPA is negotiating a contract with researchers at the University of Illinois, Urbana, on the effects of whole body and local exposure to microwaves on local tissue blood flow. Dr. Kenneth Holmes of the Department of Veterinary Biosciences and Dr. Richard Magin of the Department of Electrical Engineering are the joint principal investigators. They will use 2450 MHz radiation at both thermal and subthermal levels, though the exact power densities have still to be worked out . . . Drs. Norman Rosenthal and Thomas Wehr at the National Institute of Mental Health have found that exposure to visible light—special bright lights—can relieve depression, according to an item in the May 21 *Washington Post*. The lights fooled the participants into thinking it was still summer in the middle of winter, helping them fight off what the researchers have called "gray sky syndrome."

Communications . . . The FCC has allocated 3 MHz of spectrum space for one-way paging systems. The recent action makes room for 80 paging channels in the 929-932 MHz band . . . Commission rules for low-power television are in the May 18 *Federal Register* (47 FR 21468) . . . In response to petitions from the Local Digital Distribution Company and Satellite Business Systems, the commission has reconsidered its spectrum allocation decision for digital termination systems (DTS) (see *MWN*, February 1981). DTS power limits are now calculated by power spectral density rather than absolute power. So far 29 applicants are seeking DTS licenses . . . The interconnection, which phone companies will provide for cellular systems operated by non-wireline companies, will be discussed at an FCC public meeting June 16. Contact the commission's Tom Gutierrez at (202) 632-6450 for details . . . The Justice Department has filed for a partial stay of the FCC's authorization for cellular radio service. The department asked that the commission accept applications on June 7 as planned but be restrained from processing those from local phone companies until completion of a legal review . . . AT&T, GTE, MCI Communications, LIN Broadcasting, Associated Communications Corp. and Western Union are among the companies seeking licenses . . . Metro-media Inc. is acquiring Radiofone Corp. and plans to finance the radio paging operator's cellular action . . . The May 10 *Electronic News* reports on joint ventures among radio common carriers for entry into cellular markets. Up to \$20 million in start-up costs may be required for a single market . . . Away from the cellular front, GE wants 9 MHz of the 900 MHz band for personal radio communications services (PRCS). A "base" station tied in to customers' home phones and a "mobile" unit installed in their cars would allow drivers to make calls 5 to 15 miles from home. GE is seeking a mass, general consumer market with a system priced at around \$400 . . . Stock market quotes sent via FM radio will soon flash across hand-held receiver display screens. Dataspeed Inc. of San Francisco plans to introduce a small gadget in December that can receive all prices from major stock exchanges in 70 seconds.

Compatibility & Interference . . . The Bureau of Mines is worried about the possibility that communication and control devices, installed to improve safety and productivity, may interfere with each other. The bureau has issued a RFP (J0123038) to identify those devices, including mining machines, shuttle cars, conveyor systems and radio communication systems, which may interact. The contractor will develop solutions to minimize any harmful RFI . . . The FCC has acted favorably on a petition by the Computer and Business Equipment Manufacturers Association (CBEMA), which sought certain exemptions from RFI verification procedures. The FCC decided to allow the operation of Class A and B computing devices at trade shows and at the manufacturer's site prior to verification of compliance with the commission's RFI regulations. Class A devices, generally large mainframe computers, can also be tested at the users' sites; Class B computers, such as personal computers, were not exempted however. The CBEMA petition was filed on December 8, 1980; the commission issued its decision on March 22 . . . Inverters that convert DC from solar cells to AC emit radiation over a broad frequency range which can interfere with AM radio reception. An item in the May 15 *Science News* cites tests performed by NBS's John Adams that indicate photovoltaic cells will probably need shielding . . . The FCC is seeking further public comment on rules to alleviate interference caused by noncommercial, educational FM stations in the 88-92 MHz band to the operation of Channel 6 (82-88 MHz) in the same area. For more information contact FCC's Gordon Godfrey, (202) 632-9660 . . . The commission is also soliciting comments on how to implement the agreement reached on AM broadcasting at the 1981 Rio de Janeiro conference. See 47 FR 18009, April 27, or contact Louis Stephens, (202) 632-7792, on legal issues or Larry Olson, (202) 254-3394, on engineering matters . . . Comsearch, Inc., of Reston, VA, is now offering free literature on "Interference Protection for Cable TV Systems from Low Power TV Stations." For more information contact: Jerry Schulman, (703) 620-6300.

EMP . . . *Science* magazine's William Broad took his arguments against increased funding of space weapons in the face of EMP threats to the op-ed page of the *New York Times* (May 13) . . . The piece prompted a reply (May 23) from Frederick Jacobs, who, basing his views on articles in the January 18 and March 15 *Aviation Week and Space Technology*, believes that DARPA is now aware of the EMP problem and addressing it. Jacobs is a freshman at the University of Chicago . . . The papers to be presented at the July 23 *Conference on Hardened Electronics and Radiation Technology* at Nellis AFB, Las Vegas, NV, will be published in a special issue of the *Journal of Defense Research* . . . The Army Construction Engineering Research Lab in Champaign, IL, is looking for a contractor to revise technical manuals on the effects of EMP with emphasis on protection and shielding.

Government . . . EPA has announced the appointment of a new director of its Office of Radiation Programs. Glen Sjoblom, the assistant director for environmental controls in the navy's reactor program, will soon replace Dr. Gordon Burley, who has been serving as the office's acting director since the departure of Dr. David Rosenbaum . . . At OSHA, Dr. R. Leonard Vance has been named the head of the Directorate of Health Standards Programs. Vance, a chemist and lawyer, was an assistant attorney general in Virginia. He replaces Dr. Bailus Walker, who resigned last year . . . An NTIA spokeswoman said that there have been no new developments on finding a new home for ERMAC. NTIA wants to transfer the responsibility for coordinating federal activities on the bioeffects of RF/MW radiation, but it is not clear who, if anyone, will pick up the advisory committee's work. (See *MWN*, May 1982.) Meanwhile, the House Energy and Commerce Committee approved an FY83 budget of \$13.4 million for NTIA while the Senate Commerce Committee supported the Reagan Administration's request of \$12.4 million. A conference committee will settle the difference; a compromise of \$12.9 million is expected. The extra \$500,000 would be allocated to continued funding of NTIA's public telecommunications program, contrary to the administration's plan to phase it out . . . On another front, NTIA is

soliciting proposals for a study to see which parts of its Spectrum Management and Federal Systems program can be contracted out to the private sector. The Electromagnetic Compatibility Analysis Center which is operated by the IIT Research Institute for DoD is one example of such outside assistance. Solicitation No. SA-82-RSB-0029 was issued May 6. . . . BRH's Technical Electronic Product Radiation Safety Standards Committee (TEPRSSC) is once again looking for new members to fill four vacancies coming up on December 31. Those persons nominated last year but not elected will be reconsidered. New nominations are due by July 12. For more information contact: Dr. Zory Glaser, (301) 443-3429.

Litigation . . . A local citizens group in Coventry, CT, has filed suit in the state's Superior Court to block a relay transmission tower proposed by US Telecommunication Systems, an ITT subsidiary. Citizens Against the Tower is appealing the town Zoning Board of Appeals' April 20 approval for the 20-watt facility because of concern over potential radiation health hazards. Lawrence Bates, the group's attorney in Coventry, has also requested a temporary restraining order to prevent construction until the case is settled. A hearing on the request is scheduled for June 16. According to ITT's attorney, William Hall, the company has offered to delay construction plans in exchange for dropping the restraining order request and quickly taking the case to court this summer. The Coventry site is one of four towers being planned to link New Jersey and Boston. Hall explained that "the company is anxious for speedy disposition of the case so that the whole system can be built." ITT has already completed a system with over 100 towers between Houston and New Jersey. At zoning board hearings last month, Dr. Herbert Pollack testified as a medical consultant for ITT and Dr. Sol Michaelson appeared for the board.

Medical Applications . . . Francis Smith of the Department of Nuclear Medicine at the Aberdeen Royal Infirmary in Aberdeen, Scotland, reports in the April 24 *Lancet* that no short or medium term ill-effects have been found after the examination of 548 patients and healthy volunteers, ranging in age from two weeks to 84 years, with an NMR imager. The imager used was designed and developed in Aberdeen. He believes that NMR imaging is a "safe technique at the magnetic fields used for imaging and that it does not cause any ill-effect." . . . Dr. Ian Pykett, a member of the research team on NMR imaging at Massachusetts General Hospital in Boston, has written a review article, "NMR Imaging in Medicine," for the May issue of *Scientific American* . . . An "electric Band-Aid" could speed up the healing of wounds, according to a presentation by Oscar Alvarez of the University of Pittsburgh School of Medicine at the Society for Investigative Dermatology meeting in Washington, DC, and reported in the May 22 *Science News*. An electrode made of silver impregnated cloth, which was placed over surface scrapes, reduced the healing time from 4.6 to 2.9 days, compared with no treatment. More work is needed before any firm conclusions can be reached.

Ovens . . . Congressman Richard Ottinger's (D-NY) subcommittee on energy conservation and power of the House Committee on Energy and Commerce held hearings on DOE's decision not to set efficiency standards for appliances, including microwave ovens, on May 21. (See *MWN*, May 1982.) Ottinger, with the support of 50 co-sponsors, has introduced H.R. 6202, which would amend the Energy Policy and Conservation Act to eliminate the preemption of state standards. Ottinger attacked DOE's analysis supporting the "no standard" approach as "manipulated" and an example of "voodoo economics." His position was supported by a recently released GAO report, *Appliance Efficiency Standards: Issues Needing Resolution by DOE* (GAO/EMD-82-78, May 14, 1982), which concludes that the basis for DOE's proposal is "highly questionable." Representatives of DOE testified that the agency's position was that "mandatory federal standards would place unnecessary restraints on manufacturers." The Association of Home Appliance Manufacturers (AHAM) endorsed the DOE decision, arguing that the marketplace would accomplish the goal of energy efficiency. . . . Meanwhile, DOE cancelled its May 11-12 public hearing in Chicago on the standards due to lack of interest. Only two requests to speak were submitted

and both parties agreed to participate at the hearings in Washington, DC, scheduled for May 18-21. . . . The Society of Plastic Industries is sponsoring a seminar on microwave oven cookware on July 26 as part of the annual meeting of the International Microwave Power Institute to be held in San Diego, CA. (See conference calendar.) . . . AHAM reports that shipments of microwave ovens were down 13.4 percent in April compared to April 1981. Factory shipments for the year now stand at 1,213,100, more than 10 percent fewer than last year.

Radar . . . Dr. Jack Verona of the Defense Intelligence Agency testified on technology transfer from the US to the USSR before the permanent subcommittee on investigations of the Senate Committee on Governmental Affairs on May 5. He argued that Soviet radar development was hastened by US lend-lease equipment sent after World War II, the unclassification of MIT Radiation Laboratory's volume on radar theory and the acquisition of American microcircuits. . . . Stephen Johnson published a reply to Thomas Amlie's article on the dangers of over-reliance on radar (see *MWN*, April 1982) in the May *IEEE Spectrum* . . . *Science News* features a report on the accuracy of police traffic radar in its May 22 issue. . . . The Rome Air Development Center at Griffis AFB, NY, is negotiating a contract with Raytheon Co. for a feasibility demonstration of HF radar.

Satellite Communications . . . The FCC voted to cut off processing new applications for orbital slots at a meeting last month. To avoid delay in assigning slots, it will now consider only the ten applications already in for approval. New applications will be processed as a separate group. . . . Most people would not buy a new television to get a better quality picture, according to a study by Frank N. Magid Associates. On May 17, *Broadcasting* magazine reported that this survey supports a push by United States Satellite Broadcasting, a direct broadcasting services applicant, for allocating spectrum to DBS rather than high resolution TV. . . . COMSAT's Satellite Television Corporation (STC) is making plans for a DBS satcom station in Las Vegas. . . . Meanwhile, FCC approval for the company's DBS satellites is pending. . . . Tandem Computers Inc. and American Satellite Co. have joined forces to market Infosat, a system for sending computerized information via satellite. An article in the May 13 *Wall Street Journal* reports that the system will be available next year. . . . On the same day, the *Journal* examines the policy issues surrounding satellite links between the US and Canada. Growing commercial demands for communications services have prompted US satcom operators to request the links, which are now not permitted. . . . The May 3 *Aviation Week and Space Technology* details features of the new Intelsat VI satellites. . . . Hughes Communications International will build Australia's first satcom system. The company recently signed a \$175 million agreement with Aussat Proprietary Ltd., the national satellite company. . . . The FCC has approved COMSAT's plans for six satcom stations in Micronesia and the Marshall Islands.

Standards . . . Approval of the new health and safety RF/MW standard is still under consideration at ANSI. . . . On another front, ANSI is seeking comment on a new standard, *Recommended Practice for the Measurement of Spurious Emissions from Land-Mobile Communication Transmitters* (No. BSR/IEEE 377-1980). It covers definition of terms, controlled test conditions, test apparatus and test methods in the range 25 MHz to 1000 MHz. For a copy send \$6 to: Board of Standards Review, ANSI, 1430 Broadway, New York, NY 10018. Comments are due July 13. . . . ANSI has also published a 16-page booklet, *Directory of International and Regional Standards Organizations*. Send \$3 to the ANSI Sales Dept. . . . The International Electrotechnical Commission has issued a technical report on *Methods of Measurement of Wideband Noise Radiated from Motor Vehicles — Appendix A: Measurement and Performance Specifications for a Standard NAD Measuring Equipment — Appendix C: Overlay Method for Assessing Receiver Degradation in the Presence of Impulsive Noise*, Publication No. 489-9, Section 2. A copy is available for \$7 from the ANSI Sales Dept. The IEC has also proposed a number of amendments to the International Special Committee on Radio Interference's Publication No. 14. For more information, contact ANSI.

Technology... A team from the Johns Hopkins University School of Medicine describes the use of 1 kV/cm electric pulses for 50 microseconds to fuse 3T3 cells in monolayer culture, in the April 30 *Science*. The researchers proposed that "transient pore formation and energization of cell membranes brought about by the electric field are responsible for the fusion of cells in close contact."... A satellite system using pulse-doppler radar could control global air traffic in the next century, according to designers at the Aerospace Corp. in El Segundo, CA. The system is described in the May 17 *Electronic News*. ... The US Army Armament R&D Command in Dover, NJ, has announced three new contracts for the development of railgun technology. Negotiations are being conducted with Sandia National Labs in Albuquerque, NM, GT Devices of Alexandria, VA, and Vought Corp., of Dallas, TX.

VDTs... A summary of VDT radiation test results from Dayton T. Brown is due in June. The firm has been testing units used by Darleen Weiss, a VDT operator who sought workers' compensation for cataracts allegedly induced by radiation from the terminals. (See *MWN*, October 1981.)... Canada's Radiation Protection Bureau retests of Bell Canada VDTs reported to emit X-rays have found nothing. Bureau director Dr. Ernest Latourneau said that the high readings taken by the company last year were the result of procedural errors. ... A VDT safety bill introduced in the Massachusetts legislature is not likely to be considered this year. (See *MWN*, April 1982.) A spokeswoman for the House Committee on Commerce and Labor that had begun review of House Bill 2910 said the measure would probably be reintroduced next year. ... The city of Toronto has agreed to grant women working on VDTs alternate work during pregnancy. The option is part of a contract between the city and the Local 79 of the Canadian Union of Public Employees.

Etc... Bernard Schwartz, the chairman of Loral Corp., has given the City College of the City University of New York \$165,000 to set up a microwave laboratory at its School of Engineering. The money, which will be used to buy equipment, is a step toward establishing a major center for microwave research at CCNY. ... Physicists at Stanford University, CA, believe they have finally detected a magnetic monopole, a single north or south magnetic pole. The discovery is causing much excitement and promises to intensify the search by other scientists. ... Dr. Merle Tuve, one of the leading developers of radar, died in Bethesda, MD, on May 20.

LETTERS

To the Editor: Upon reading your report of our work ("Low-Intensity Pulsed Magnetic Fields Stimulate Release of Noradrenaline," *MWN*, May 1982), there is one inaccuracy I would like to correct. You state that "they suggest that weak magnetic fields could damage the surface of cell membranes" whilst we stated that "irreversible membrane damage has not occurred."

We were able to draw this conclusion because we designed part of the protocol to specifically check this possibility. The observations that elevated Mg^{++} levels inhibit the stimulated release and that prior exposure to our magnetic field does not alter high K^+ stimulated release both strongly suggest that the stimulation we observed is of the normal vesicle mediated stimulus coupling pathway found in these cells. Indeed, we believe that reversible co-operative interactions between surface bound glycoproteins may well mediate this response, which is a model that has been developed by Ross Adey in his recent publications.

Richard Dixey
Department of Medical Electronics, St. Bartholomew's Hospital, West Smithfield, London EC1A 7BE, England

Microwave News invites letters from its readers. We ask writers to be brief, and we reserve the right to edit contributions for length.

CONFERENCE CALENDAR

- June 15-17: IEEE MTT-S *International Microwave Symposium*, Hyatt Regency Hotel, Dallas, TX. Contact: J.R. Griffin, Texas Instruments, Mail Stop 3432, PO Box 405, Lewisville, TX 75067. On June 18 immediately after the conference, there will be a one-day workshop on *Medical Applications of Electromagnetic Energy*. Contact: Dr. Gordon Short, BSD Medical Corp., 420 Chipeta Way, Salt Lake City, UT 84108.
- June 28-July 1: *Conference on Precision Electromagnetic Measurements*, University of Colorado, Boulder, CO. Contact: Robert Kamper, National Bureau of Standards, Boulder, CO 80303.
- June 28-July 2: 4th Annual *Bioelectromagnetics Society Meeting*, Beverly Wilshire Hotel, Beverly Hills, CA. Contact: BEMS, 1 Bank Street, Suite 307, Gaithersburg, MD 20878.
- July 20-22: IEEE Annual Conference on *Nuclear and Space Radiation Effects*, Caesars Palace, Las Vegas, NV. Contact: A. Ochoa, Jr., Div. 2144, Center for Radiation-Hardened Microelectronics, Sandia National Laboratory, Albuquerque, NM 87185. This meeting will be followed on July 23 by the *Hardened Electronics and Radiation Technology Conference* hosted by the Defense Nuclear Agency. A Secret security classification is required to attend. Contact: Director, DNA, Attn: ISSO/Barbara Perkins, Washington, DC 20305.
- July 25-30: 17th Annual Symposium of the *International Microwave Power Institute*, Town and Country Hotel, San Diego, CA. Contact: IMPI, 301 Maple Ave. W., Tower Suite 520, Vienna, VA 22180.
- August 11-13: 4th Annual *Satellite Communications Users Conference*, Regency Inn, Denver, CO. Contact: Satellite Communications Magazine, 3900 S. Wadsworth Blvd., Denver, CO 80235.
- August 16-18: 1st Annual *Meeting of the Society of Magnetic Resonance in Medicine*, Boston, MA. Contact: Deedee Correia, NMR Laboratory, Research 501, Massachusetts General Hospital, Boston, MA 02114.
- September 5-11: *World Congress on Medical Physics and Biomedical Engineering*, including the 13th *International Conference on Medical and Biological Engineering* and the 6th *International Conference on Medical Physics*, Congress Center, Hamburg, Germany. Contact: MPBE 82, Congress Organization, PO Box 302360, D-2000 Hamburg 36, Federal Republic of Germany.
- September 6-10: 7th *Colloquium on Microwave Communication*, Budapest, Hungary. Contact: Secretariat of the 7th Microcoll, H-1525, Budapest 114, POB 15, Hungary.
- September 8-10: *International Symposium on Electromagnetic Compatibility*, Marriott Hotel, Santa Clara, CA. Contact: Dr. Andrew Nalbandian, 20617 Debbie Lane, Saratoga, CA 95070.
- September 13-17: 12th *European Microwave Conference*, Helsinki, Finland. Contact: Prof. M. Tiuri, Helsinki University of Technology, Radio Lab, Otakaari 5A, 02150 Espoo 15, Finland.
- September 14-16: 4th *International Workshop on Biomagnetism*, Rome, Italy. Contact: Dr. G. Spissu, Istituto di Elettronica dello Stato Solido del C.N.R., Via Cineto Romano, 42-00156, Rome, Italy.
- September 20-21: 4th Annual *Conference of the IEEE Engineering in Medicine and Biology Society*, Marriott Hotel, Philadelphia, PA. Contact: Dr. Alfred R. Potvin, Department of Biomedical Engineering, PO Box 19138, University of Texas, Arlington, TX 76019.
- September 20-22: 2nd Annual *Meeting of the Bioelectric Repair and Growth Society*, Oxford, England. Contact: Dr. B.F. Siskin, Wenner Gren Research Laboratory, University of Kentucky, Lexington, KY 40506.
- September 22-24: 35th Annual *Conference on Engineering in Medicine and Biology*, Marriott Hotel, Philadelphia, PA. Contact: ACEMB, 4405 East-West Highway, Suite 210, Bethesda, MD 20814.
- October 26-28: 1st *International Symposium on Medical Imaging and Image Interpretation*, Berlin, West Germany. Contact: Dr. Judith Prewitt, c/o IEEE Computer Society, PO Box 639, Silver Spring, MD 20901.

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