

Minutes January 10, 1997

Quote of the Month:

"Epidemiology is a science of association, relying on statistics plus knowledge of how illness or accidents come about...The purpose is to detect what is causing the problem and how great the problem is, in order to ultimately reduce or eliminate its incidence. Epidemiology is based on observation in populations, and is thus in contrast with laboratory studies, which develop hard cause-and-effect relationships from experimental evidence...."Clusters" almost always mean absolutely nothing... a cluster is simply an elevated incidence of disease or other problem in a given population.... There have been cases where cancer cluster studies have proven fruitful....The study of lung cancers among workers in the packaging industry found that polyvinyl chlorides were the cause...The prevalence of the disease was rare and suddenly increased in frequency. The investigations uncovered new mechanisms of disease. Yet the typical clusters trumpeted by the media involve common diseases such as cancers in general, leukemia specifically.. "

Michael Fumento in 'Science Under Siege'

1. Meeting began at 11:30 am and adjourned at 1:00 pm.
2. Members present: Cherington, Clark, Fischer, Foley, Langford, D Keen, H Keen, R Keen, Kimberling, Kovach, Rudolph, Toler, Watts, Yarnell.
3. New members: Charlene Kovack, Alan L. Watts, MD
4. I brought the following articles that were recently published:

a. Electromagnetic field exposure may cause increased production of amyloid beta and eventually lead to Alzheimer's disease in *Neurology* 1996;47:1594 by Sobel and Davanipour. The authors suggest that amyloid beta found in cerebral blood vessels may come from a peripheral source and lead to Alzheimer's disease (AD). They report that having a primary occupation with exposure to extremely low frequency (ELF) electromagnetic field (EMF) significantly increases the risk of AD. They define high EMF exposure as averaging above 10 milligauss (mG) and medium exposure between 2 and 10 mG. The EMF exposures are from the use of electrical and motorized equipment located very close to the body. These are found in certain occupations such as: machinist, seamstress, tailor, keypunch operator, projectionist, etc.

The authors stress that they are not speaking about EMF exposures from high power electrical lines or ambient residential EMF exposures. Power line exposures are very infrequently above 2 mG. They suggest that low-cost public health measures can be taken to reduce occupational EMF exposure: design changes and shielding for new motors. Magnetic field strength drops off with the square of the distance. Motors on existing industrial sewing machines and other equipment should be moved further from the person using the machine.

b. Long Thoracic Nerve Injury Due to an Electric Burn by JM Still et al in *J Burn Care Rehab* 1996;17:562. The authors describe the case of a 19 year old man who was injured when an electric transformer exploded. He was subsequently found to have paralysis of the serratus anterior muscle. The authors reviewed the literature and found 90 cases of long thoracic nerve injury where the cause was available. In 35 cases the cause was acute trauma. Repeated trauma has also been reported to be a cause. They found only one other case similar to their case: a 110-v

current as the result of a short circuit in a hand drill caused serratus anterior paralysis.

c. Static electricity as a mechanism of bacterial transfer during endoscopic surgery by R Becker et al. in *Surg Endoscopy* 1996;10:397-399. According to the authors surgeons may cause a break in sterile technique by placing the gloved hand in proximity to the video monitor screen. The electrostatic field generated by the video monitor could serve as a mechanism of bacterial contamination during endoscopic surgery. During such surgery, the surgeon may point to the monitor. This should be avoided. The surgeon's glove acts as a charged object because it accumulates static charge due to its nonconductive property. The video monitor is also a charged object, accumulating static charge due to the slow drain of negative charges from the electron-bombarded, phosphorous-coated screen. The ambient air in the operating room is contaminated by microorganisms attached to particles such as lint, dust, and skin squames. The authors contend that static electricity is a mechanism of bacterial transfer.

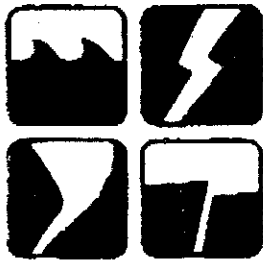
I received a request from Ms. Barbara Deickman for one of our members to speak to a group of young people, some of them with The Boy Scouts of America, about lightning. She is a volunteer with the group called First Responders which meets twice per month at Aurora Regional Hospital. Ken Langford agreed to speak at that meeting.

5. Phil Yarnell reported on cases about which he has been consulted.
  - a. Three years ago, a 25 year old man installed a sprinkler system when an electric line to the street lights were cut. Since then he has suffered with headaches and musculoskeletal pains. Phil asked the question: Can 125 volt shock be sufficient to account for symptoms of 3 years duration? Michael Foley answered: Yes, if the voltage was enough to break down the skin's resistance. Current could travel from the wire to the body to earth. It is well known, of course, that if a person were in water, such as in a bath tub, the lowered skin resistance would allow current to flow into the body. Terry Rudolph commented that welding equipment may be particularly dangerous because of large current capacity. Helen Keen mentioned that some cases of fibromyalgia, a controversial diagnosis in some quarters, has been reported following electric shock.
  - b. A mother and her daughter from Minnesota were struck by lightning in August 1996. The daughter died. Her mother survived by has several lightning sequelae: ruptured tympanic membrane, post-traumatic amnesia, and numbness of the extremities. Neuropathies are uncommon, if not rare, after lightning strikes. The numbness could suggest a myelopathy. Nerve conduction studies were normal.
6. Alan Watts told us of lightning events that he has personally witnessed. When he was 10 years old, lightning struck a haystack near the Nebraska barn door where he was standing. In 1975, Alan and his burro climbed to a lake high in the San Juan mountains. Alan began fishing when lightning struck about 30 feet away across the lake. He immediately moved away from the lake and descended the mountain. Ken Langford praised him for taking prudent actions.
7. A Ken Langford photograph is on the cover of the current issue of "Weatherwise."

8. Dick Fischer told us that in the first part of this century, before REA (Rural Electrification Administration), more people were killed by 110 volt exposure than by higher voltages. Today, there are many fewer injuries from exposure to 110 volts than from higher voltages. However, danger from low voltage is still present.
9. Julie Kimberling reported that Michael Boyson has received data from about half of the hospitals who were contacted about outpatient lightning injuries. The data to date: In 1993 there were 15 cases; 1994 - 17 cases; 1995 - 28 cases.
10. Chery Toler said that Peggy Gustafson will soon be meeting with the Marketing department and will report to us further at the next meeting.
11. Terry Rudolph brought examples of computer simulations of fractal electrical discharge which were performed with a high voltage electrode (10,000 V) placed in the center of a square metallic box.
12. Michael Foley brought a transformer and a piece of lumber to demonstrate how to produce a ferning pattern on the wood.
13. Rich Kithil could not be present at today's meeting. He did send to me via fax yesterday, a letter to the editor in the current issue of Natural Hazards Observer. Rich's letter, discussing lightning's damaging nature for the Observer, is attached to these minutes.
14. Next meeting: Friday, February 14, 1996 at 11:30 am at St. Anthony Central Hospital.

Respectfully submitted,

  
Michael Cherington, MD  
Chair, LDC



# Natural Hazards Observer

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## A LETTER TO THE EDITOR

Editor:

Your article "Losses Due to Natural Hazards" in the September 1996 *Natural Hazards Observer* (Vol. XXI, No. 1, p. 16) made interesting reading and calls attention to how elusive loss figures are in this setting.

We would like to describe some lightning costs, deaths, and injuries as our own research has uncovered them. Here, too, accuracy and consistency are difficult to confirm.

### 1. Numbers of Deaths, Natural Hazards 1940-1981 (after Kessler, 1988)

Lightning	Tornado	Flood	Hurricane
7,741	5,268	4,481	1,923

### 2. Annual Costs Associated with Lightning (after Kirhill, 1995)

Storm Data	\$27 million
National Fire Protection Association/Fire Chiefs	\$137.8 million
Holle, et al.	\$332 million
Insurance Information Institute	\$1 billion (homeowners only)

### 3. Lightning Frequency vs. Insurance Claims (after Holle, 1995)

Average annual number of lightning strikes in the U.S.	17,600,000
Average annual national lightning-related insurance claims	307,000
Ratio of insurance claims to lightning strikes	one in 57

Lightning's damaging nature is that single accidents are the norm, unlike hurricanes, earthquakes, tornadoes, etc., in which scores of injuries and deaths and much damage may occur all at once. For these and other reasons, lightning's dangers are understated by many. We hope the *Natural Hazards Observer* will devote more coverage to this threat.

Rich Kirhill  
President  
National Lightning Safety Institute

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