

Quote of the Month:

"The crowning achievement of seventeenth-century science -- Newton's law of gravitation....He made his first experiment as a young man of sixteen when a great storm raged over England. To find out the force of the wind, he first jumped with and then against it, and by comparing these distance with the extent of his jumps on a calm day, he was able to compute the force of the storm...In 1687 Newton published his immortal *Philosophie Naturalis Principia Mathematica*....Newton outlined the universal law of gravitation -- 'Every particle of matter is attracted by or gravitates to every other particle of matter with a force inversely proportional to the squares of their distances.'"

Louis Snyder

1. Meeting began at 11:30 am and adjourned at 1:05 pm.
2. Members present: Bergschneider, Carney, Cherington, Collier, Hodge, Keen, Kithil, Rossie, Schiavoni.
3. I distributed the following materials:
  - A. An article in *Nature Medicine* by Orla Smith (January 1996) entitled "Cells, Stress, and EMFs." In that article the author states: "It has long been known that cells respond to a variety of environmental stresses (such as elevated temperature, heavy metals, toxins, free radicals, etc.) by rapid production of a family of proteins called the heat shock proteins. This response is found in all bacteria, plant and animal cells. Heat shock proteins are divided into four major families according to their molecular mass....These molecular chaperones then bind to other partially denatured proteins in the stressed cell, helping them to refold into their native configuration and regain their activity....It is generally believed that EMFs per se are not initiating events in cancer progression, but may provide yet another stress to cells already affected by other environmental 'hits'."
  - B. FDA Medical Bulletin (June 1996) -- "Hazards associated with the use of electric heating pads." "...many reports of injury and death from burns, electric shocks, and fires associated with the use of electric heating pads. These incidents have occurred in nursing homes, hospitals, and at home...Prolonged use on one area of the body can cause a severe burn, even when the pad is set at a low temperature."

George Rossie pointed out that there is some evidence that water beds and electric blankets may be hazardous to pregnant women. George Hodge said that the manufactures of electric blankets are designing them to reduce the exposure to 60 Hz electric current. Two parallel carbon rods are placed so that alternating currents 'cancel' magnetic field effects.
  - C. An article in the *Scandinavian Journal of Work Environment and Health* 1996;22:85-93 by Jorma Valijus entitled "Health risks of electric and magnetic fields caused by high-voltage systems in Finland." The author concludes "...power frequency electric and magnetic fields can be considered not to be a major health concern. The only finding which may be of clinical importance is pacemaker interference in electric fields even of the order prevailing near 110 kV lines."
  - D. A post card from Dick Fischer in Heidelberg. He states that he visited a lightning demonstration at the Munich Science Museum.

E. A copy of the Newsletter, *Safe & Sound*, June 1996. The lead article is entitled "When the Sky Comes Crashing Down on You." This publication is a "Newsletter for Your Family's Safety and Health." The article provided a list of strategies to avoid being struck by lightning.

Bonnie Enloe of the Continuing Medical Education Office will be leaving St. Anthony Hospital and taking a position at Poudre Valley Hospital in Fort Collins. She indicated that she will help set up a video-conference type program between our LDC meetings and her new hospital.

- 4. Kathy Schiavoni of Clinical Information Department attended the meeting. She and Julie Kimberling will be hospital data on electric trauma and lightning injuries to present at a future meeting.
- 5. Melissa Carney distributed the updated copy of our Directory for members to review. It will be sent out with these minutes. Melissa announced that she has been working with Peggy Gustafson and Rich Kithil to arrange a Lightning Safety Program sponsored by SAC and LDC to be held on August 21, Wednesday from 9am to 11am in the Main Auditorium. The program is open to all but much of the program will be directed toward the managers of Parks and Recreation Programs.
- 6. Richard Keen told us that he will travelling to Alaska this month to participate in the Juno Icefield Research Project. He will lecture on meteorological topics and engage in research studies. I asked him about lightning frequency in the state of Alaska. Richard said that the number of lightning strikes in Alaska is small, but the damage to forest lands can be major.

Richard brought the details of a fatal lightning strike on May 13, 1985 in Huntsville, Texas. The victim was standing under an Oak Tree which was "struck from a distant cloud." The skies were overcast but there had been no lightning before the one that hit the tree. The "active cell" was hidden by the grey skies.

Richard distributed the following materials:

A. "Lightning at Sea" by Edward C. Brainard in *Mariners Weather Log*. The author points out that "there is no perfect grounding system since the current flow is so extreme at the time of the strike. The lightning will electricity saturate your grounding system and find other paths to the sea." There are reports of "lightning striking fiberglass hulls which have carbon fiber laminates. In one case, the lightning heated the carbon fibers and delaminated the hull."

B. "Absolute Protection--How to Avoid Damage from the Big Strike" by William A. Rhodes in *Monitoring Times* July 1996. The author discussed the cone of protection. He states that in his laboratory, tests run with a 160 kV Van de Graaff generator provided "ample proof that absolute protection is not attained outside the radius of 1:1 with the rod."

Rich Kithil declared that lightning "has its own agenda" and absolutes do not apply when it comes to matters of lightning.

- 7. Rich Kithil presented an update on the activities of the National Lightning Safety Institute. These items are attached to the minutes.

Richard read an Email letter that he received from a man in Minnesota who was jogging on a country road when he was "overtaken" by a thunderstorm. Before he was "thrown into a ditch," he experienced hair standing on end and

a "weird ozone taste" in his mouth. That report elicited a discussion of the possible cause of the abnormal taste. I reported learning that on a popular TV talk show, several lightning victims reported abnormal tastes and smells. George Rossie suggested these phenomena resemble the aura of psychomotor seizure patients and wondered if there was an inductive effect on the brain. George Hodge reported that he would often test a 9 volt battery by placing it on his tongue and would experience an unusual taste. We would be interested in hearing from our members about their thoughts on this matter.

8. George Hodge provided us with photographs and a videotape from Channel 7 News on July 4 of a house that was struck by lightning. The house in Lakewood near the intersection of Wadsworth and Mississippi suffered extensive interior and exterior damage. A tall tree just outside was not struck or damaged. A large sheet of aluminum siding may have acted as a down conductor. The entrance point was above the aluminum on the roof. George found a loose ground connection under the kitchen sink. These ground connectors are usually in the vicinity of the current breaker box with 1/4 inch wire attached to the ground rod. George was interviewed by the television personnel and is now our newest TV personality.
9. Rich Collier has been working on the indirect effects of lightning at the Space Shuttle launchpad in Florida. I asked why Florida, the highest lightning density state, was chosen for the site of the launch pad. Rich Collier and Rich Keen stated there are at least three reasons: a) the eastern seaboard site allows for aborted rockets to land in the ocean; b) the warm weather is an advantage, and c) at that latitude the earth's motion may be an advantage for these flights.
10. George Rossie just returned from a kayaking trip in Anchorage, Alaska. He reports that he experienced many rainy days but saw no lightning.
11. Kevin Bergschneider is soon to depart to Atlanta, the site of the Olympic games. He plans to learn what precautions have been taken to reduce the risks of lightning to athletes and spectators. Rich Kithil has been contacted by persons working on Olympic games to be held in Savannah, Georgia and in Tennessee where kayaking events will occur. Rich recommended that important steps to take included proper signage and evacuation routes.  
Kevin distributed a brochure published by the Public Service Company with safety tips for those indoors. They suggest that one turn off the air conditioner because surges from lightning can overload the compressor. Draw the blinds and shades over the windows to reduce the chances of glass shattering into the house.
12. Next meeting: Friday, August 9, 1996 at 11:30 am in the Main Auditorium of St. Anthony Central Hospital.

Respectfully submitted,



Michael Cherington, MD

# **NATIONAL LIGHTNING SAFETY INSTITUTE**

⇐ Risk Management of the Lightning Threat ⇐

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## **RECENT NLSI ACTIVITIES**

**July, 1996**

1. A two day in depth lightning safety training program called "Certified Lightning Safety Professional" (CLSP) will be conducted in Louisville next week. The class intends to create an in-house lightning safety expert for organizations. This session's attendees are from Allegheny Power Co., Hughes Information Technology Systems (3), Lockheed Martin Astronautics (2), Environmental Protection Agency, Westinghouse Savannah River Company, US Dept. Labor (MSHA), Collins Control, ERICO, Orange County Public Schools, US Air Force, Club Car, Great American Insurance Company and Vyvx/Teleport. Similar classes are scheduled for Orlando (August), Washington DC (October), Chicago (November), Phoenix (January), and Houston (March). Co-instructors are NLSI President Richard Kithil and NLSI Director of Engineering Richard Hasbrouck.
2. RF Testing can mimic lightning's behavior upon structures and can reveal weaknesses in lightning defenses. The procedure has analyzed KSC launch pads and the Device Assembly Facility in Nevada. Richard Collier and Richard Hasbrouck, both NLSI Board members, have been a part of this pioneering technology. NLSI is discussing a familiarization and training program in RF Testing with Instituto Nacional de Pesquisas Espaciais (INPE), the Brazilian Space Agency. INPE competes in the world satellite launch market with the USA, France, China, Japan and others. (See INPE on the WWW at: <http://www.inpe.br/>)
3. NLSI has been contacted by Du Hao, Deputy Director, China Center for International Foreign Experts (CCIFE). CCIFE invites about 70,000 foreign experts to work in China every year. A CCIFE-NLSI arrangement would focus on lightning safety for industrial, government, and large commercial facilities.
4. NLSI expects to conduct three separate site surveys for a large wind turbine manufacturer. The installations are a part of a demonstration project sponsored by the Department of Energy, National Renewable Energy Laboratory. The wind turbine industry, once focused in California (little lightning), is moving eastward (more lightning). Lightning safety is an issue not well understood by the wind turbine industry.