

Minutes December 13, 1996 Lightning Data Center St. Anthony Hospital Central

Quote of the Month:

"Don't you know that there is no better conductor for lightning than an open chimney? Now where have you got to?

I'm here by the window.

Oh, for pity's sake, have you lost your mind? Clear out from there, this moment. The very children in arms know it is fatal to stand near a window in a thunder-storm."

Mark Twain in Mrs. McWilliams and the Lightning

- 1 Meeting began at 11:30 am and adjourned at 2:10 pm.
- 2 Members present: Boyson, Cherington, Clark, Fischer, Foley, Glancy, Golbert, Gustafson, Hodge, Kamin, H Keen, R Keen, Kimberling, Kithil, Langford, Larson, Seimon, Toler, Wachtel, Yarnell.
- 3 I distributed the following articles:
  - a. A newspaper article sent to me from C. B. Moore of Socorro, NM. The article is entitled: 'Lightning hit, made me quit smoking, local man says,' and is in the Nov. 14, 1996 issue of The Albuquerque Tribune by Richard Benke. A 30 year old man at Kirtland Air Force Base was "out in the rain having a cigarette when lightning struck him." He was unconscious for 2 days. "The lightning hit the tree first and went through my body and out my right foot."
  - b. Professor Sid Deutsch from the University of South Florida sent to me an editorial by Robert Park in the New York Times (November 13, 1996). The editorial was entitled: Power Line Paranoia. According to the article: "After 17 years, the scientific debate over possible adverse health effects of electromagnetic fields from power lines has finally been put to rest by experts at the National Academy of Sciences....The chairman...was asked if the panel recommended 'prudent avoidance.' Mr. Stevens replied that 'we wouldn't know what to suggest people avoid.'"
  - c. "Study on electrocution death by low-voltage" by Z.Peng and C.Shikui Forensic Science International 1995;76: 115-119. They report 7 cases of electrocution by voltages below 80 volts. All involved electric welding machines. Usually, the "resistance of the skin results in a low current intensity, one will just have a feeble sensation of tingling, which will cause the contact to be voluntarily broken." In their 7 cases, "perspiration of the contact sites reduced the local resistance further. Therefore, the low voltage resulted in an appreciable current." The duration of contact "was not short because of the severity of the burns."
  - d. "Neurologic and Neurobehavioral Effects of Electric and Lightning Injuries" by TJ Janus and J Barrash J Burn Care Rehab 1996;17:409-415. They report 12 cases of electric trauma and 2 cases of lightning injuries. The patients had "neurobehavioral symptoms....a coherent syndrome characterized by disturbances in cognition (attention and memory), mood (distress with prominent irritability), and behavior (aggressive outbursts).
4. Rich Kithil presented the Chairman and the LDC with a handsome hourglass timer gift. It is to be used to remind every speaker when ten minutes have passed.

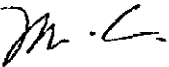
- Rich's report from NLSI (National Lightning Safety Institute) is enclosed with these minutes.
5. Rich Keen presented data covering an 11 year period for Coal Creek Canyon and Boulder. He and an associate, Kathy Smith, collected data on thunderstorm days for these two sites. Rich speculated that the thunderstorm cycles may correspond to sun spot cycles. Rich introduced his wife, Helen, who just completed her Masters program in Nursing at the University of Northern Colorado. The members congratulated Helen and welcomed her to our group.
  6. Michael Boyson and Julie Kimberling have been collecting outpatient data from Colorado hospitals and clinics. Michael believes he has now heard from 30% of the facilities. So far there are 11 cases in 1993 (8 from LaJunta); 9 cases in 1994; and 14 cases in 1995. None of these patients were admitted as inpatients. Julie reports that she has found 12 cases at St. Anthony Central and 2 cases at St. Anthony North during that same period. Michael and Julie believe almost all cases will be collected by next month.
  7. Bob Glancy reported on the total number of cases in Storm Data for those same 3 years (1993-1995). He can account for 58 cases (deaths and injuries). We hope to be able to analyze all data (fatalities, inpatients, and outpatients) within the next month or two. Bob told us that 6 people were inside their houses when they were struck (3 were on the telephone). In one house a mirror exploded and people were injured by flying glass. Six people were injured while inside an automobile on August 3, 1994 near Trinidad, Colorado. No additional information is available at this time regarding this automobile incident.
  8. Barry Kamin brought a biographical article on Bruce Miller from AOPA Pilot magazine. The article is written by Julie Boatman. Bruce Miller flies a glider called *Explorer* for NCAR (National Center for Atmospheric Research) in Boulder. The glider is reinforced to withstand the stresses of flying inside cumulonimbus clouds. Rich Kithil mentioned that Bruce Miller works with LDC member Dan Breed. Ken Langford said that gliders are more safe than airplanes to study lightning in clouds because there is no fuel to ignite.
  9. Anton Seimons recently returned from a meeting in Florida and he reports on the the following 3 papers:
    - a. A paper given by US Air Force personnel about a lightning fatality case. The person killed was a mechanic who struck on the ground by lightning while working on the plane.
    - b. A paper about a 'bolt from the blue' originating from the 'side' of the thundercloud and travelling 24 miles before striking radar apparatus.
    - c. Lightning injuries in the Tampa, Florida region last year numbered 123 injuries and 13 fatalities. These are the largest numbers for this region for a single year.
  10. Ken Langford reported he spoke with Duncan Blanchard, author of "From Raindrops to Volcanoes," who will send to Ken a video of volcanic lightning which we may see at our next meeting.  
The cover of the next issue of Weatherwise (Dec/Jan) will highlight a Langford photograph!!
  11. Steve Clark told us of an article on: The Impact of Natural Hazards on Chemical Facilities. Steve states that lightning is the greatest threat to these facilities. He will bring copies of this article to our next meeting.

12. Michael Foley brought a picture of 'ferming' pattern from a fallen power line on a sidewalk. This magazine picture was taken by Morris Mazer. Terry Rudolph gave me a remarkable picture of a fern pattern which he produced on a photographic plate by 30 kV charge. Phil Yarnell brought pictures, provided by a coroner, of ferning found of the thorax and leg of a fatal lightning case. At our next meeting, George Hodge was bring his transformer and generate (15,000 v) a fern pattern on a piece of wood. What is the cause of the fern pattern on skin? Members suggested it could represent: vascular dilatation in 'ionizing pattern', a coronal pattern, a transient epidermal reaction similar to the redness that seen when skin rubs against the corner of a desk top, a fractal phenomenon, or a combination of any of these suggestions. We invite any other comments about this phenomenon which is said to be characteristic of lightning (or electrical) trauma.  
Michael quoted an news article regarding the EMF related to overhead powerlines. When powerlines are buried, the EMF 'problem' is mitigated but not eliminated.
13. Tom Golbert recalled a day when he was caught in a 'torrential downpour and lightning' while driving west from Goodland, KS. His left windshield wiper broke and fell from the car. He pulled over to the side of the road. When lightning struck near his car, it illuminated his surroundings so that he could see a highway underpass a few feet in front of him. He drove there and then replaced the wiper with a spare from the trunk of his car. Most members of the group (well know as Monday morning quarterbacks) suggest that in the future, if lightning is nearby, he should remain in the car until the storm has passed. Anton mentioned that the openings of caves are also unsafe because ground current can 'jump the gap' over the opening.
14. Peggy Gustafson reported on the follow-up responses from the participants of last summers Lightning Safety Seminar given to coaches and park managers by Rich Kithil. The responses were universally positive. Many had instituted policy changes. Others had started teaching programs for children. Rich has agreed to work with Peggy and members of LDC to develop more seminars for 1997.
15. George Hodge said he is investigating 2 incidents of lightning strikes to houses that occurred last summer. Rich Kithil commented that lightning can occur in the winter. Winter lightning is less common and is usually limited to the high country and mountain tops.
16. Howard Wachtel attended a meeting in Albuquerque where he spoke about the effects of induced current on cardiac rate. The heart is most vulnerable to changing magnetic fields at the beginning of cardiac systole.  
Howard commented on the recent reports dismissing the health hazards of EMF from powerlines, etc. Howard, who did early work in this controversial field, predicted this outcome in the past. He points out that there may be other factors the accompany powerlines which may implicated: high traffic density; air pollution; noise pollution; more illumination which can depress levels of melatonin, an oncostatic natural substance that suppresses free radicals.
17. Ron Larson did a statistical analysis of the probability of 5 members of one family being lightning victims at different places and different times. This issue was discussed at our last meeting, pertaining to the family known to our group. Ron's conclusions, based on some assumptions, include: if the time period investigated is long (e.g. 100 years) and if the size of the family is large, there may actually be

a few such families in the United States.

18. Phil Yarnell spoke to Scott Gerard who installed the early streamer lighting protection system at Coor's baseball field. Mr. Gerard will attend our next meeting. Phil has reviewed the chart of a soccer player who was struck by lightning. She was part of the college soccer team in Beria, Kentucky. She has a residual tremor of her upper limb. There were 10 other soccer players on the field at the time of the storm. He has also reviewed the chart of a retired lawyer from Montana who was struck while playing golf wearing metal cleats. He continues to have difficulty with walking. Phil will see him for a neurological evaluation soon.
19. Anton Siemon provided us with a didactic and videopresentation of severe storms in the northeastern states (1989, 1990) and a severe storm in St. Francis, Kansas (June 7, 1994). Anton has done undergraduate work at State University of New York and plans to pursue his PhD degree. For the severe storm and tornado near Plainfield, NY (1990), he plotted lightning flashes on a weather network map. He showed us positive lightning strikes (single strokes of long duration, up to 1msec) as compared to the brief multiple strokes of negative strikes. The video of the Kansas lightning storms and tornado was dramatic. Anton attributes the darkness of ominous clouds to their liquid water content.
20. Our next meeting: Friday, January 10, 1997 at 11:30 am in the Main Auditorium of St. Anthony Central Hospital.

Happy Holidays everyone.



Michael Cherington, MD  
Chair, LDC

# **NATIONAL LIGHTNING SAFETY INSTITUTE**

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## **NLSI Newsletter to LDC, Year End 1996**

1. For the LDC library:
  - a. Vandenburg, et.al., *Investigation of Deaths Related to Electrical Injury*, Southern Med. Jnl, Sept, 1996. 5 Case Studies.
  - b. Sabrina, *Kids' Lightning Information and Safety*, WWW: <http://azstarnet.com/~anubis/zaphome.htm> A child's recollection of her lightning injury.
  - c. *Lightning Activity in the United States*. Flash Densities for most USA cities.
  - d. Edelstein, J., *Lightning Injuries: A Review and Case Presentations*, Can. Jnl. Plast. Surg., 1994. (Also on WWW at: [http://www.pulsus.com/plastics/02\\_04/edel\\_ed.htm](http://www.pulsus.com/plastics/02_04/edel_ed.htm))
  - e. Lightning Injuries, see WWW at: <http://muscat.gdb.org/bio/con/medl/medl.html>  
This is a very large search engine on the lightning/medical subheadings.
2. US DOE Office of Nuclear and Facility Safety Lightning Safety Handbook attached. Copies for LDC attendees.
3. New NLSI brochure attached. Copies for LDC attendees.
4. NLSI 1996 Year End Report attached. Copies for attendees.
5. NLSI paper "Lightning Road Behavior: A Brief History" attached. Copies for LDC attendees.
6. NLSI paper "Fun With Lightning" attached. Copies for LDC attendees.
7. NLSI paper "Lightning Hazard Reduction at Wind Farms" attached. Copies for attendees.
8. NLSI's WWW page will be updated in January.
9. New members to NLSI's Board of Advisors include:
  - a. Stan Grzybowski, Director, High Voltage Laboratory, Mississippi State University, Miss. State MS..
  - b. Richard Setchell, Senior Electrical Engineer - Telecom, Wisconsin Electric Power Company, Milwaukee WI.
  - c. Rajeev Thottappilli, Senior Scientist, Inst. High Voltage Research., Uppsala Univ. Uppsala, Sweden.
10. NLSI will conduct a two day intensive Certified Lightning Safety Professional training course in Albuquerque NM on Jan 14 & 15, 1997. The course grants NLSI's CLSP certificate to students. The course intent is to create an in-house lightning safety expert for organizations. NLSI expects to conduct this training throughout the USA in 1997.