

Minutes March 14, 1997 Lightning Data Center St. Anthony Hospital

Quote of the Month:

"In real life, research is dependent on the human capacity for making predictions that are wrong, and on the even more human gift for bouncing back to try again. The predictions, especially the really important ones that turn out, from time to time, to be correct, are pure guesses. Error is the mode....In research, the usefulness of error is that it leads to more research.... In order to get anything right, we are obliged first to get a great many things wrong."

Lewis Thomas in The Youngest Science, 1983

1. Meeting started at 11:30 am and adjourned at 1:15 pm.
2. Members present: Breed, Cherington, Clark, Fischer, Floret, Gustafson, Kamin, Kithil, Kimberling, Lammertse, Langford, Reehl, Swanson, Sulzer, Toler, H Wachtel, T Wachtel.
3. New members:
 Dick F. Reehl, P.E. of US West Communications - Grounding, Electrical
 and Lightning Protection Technical Support
 Carl E. Swanson, III - Lightning photographer
4. Visting member: Nicolas Floret, Secetaire General, APERI, France.
5. Peggy Gustafson informed us that LDC will sponsor Seminars in Lightning Safety again this year. There will be 4 sessions on April 21 and 22 directed by Rich Kithil. The target groups include: Parks and Recreation Groups; non-profit associations with an interest in lightning safety, e.g. Colorado Snowmobilers Association; Electrical Workers Association, etc.

Peggy also asked for LDC members to sign up as Volunteers for this years Channel 9 Health Fair to be held during the first two weeks of April.

6. I brought the following articles for those members present to review:
 - a. Robinson NMK, Chamberlain DA. Electrical injury to the heart may cause long term damage to conducting tissue. Int J Card 1996;53:273-7
 The authors state that electrical injury, especially with alternating current has a predilection for the sino-atrial and atrioventricular nodes. Experimental studies show AC to be more dangerous than DC. DC injury is less hazardous, producing fewer arrhythmias in experiments with dogs.

 Ischemia following electrical injury affects the right coronary artery predominantly. This is because its close proximity to the surface of the chest. This artery supplies both SA and AV nodes in the great majority of cases.
 - b. Charry JM, Hawkinshire FBW. Effects of atmospheric electricity on some substrates of disordered social behavior. J Personal Soc Psych 1981;41:185-97.
 I came across this article, written over 15 years ago, and wanted to know what our members thought of its assertions. The authors state that epidemiological data indicate increased positive air ionization due to changing weather conditions is associated with increases in accidents, suicide, crime, and depression. In ion-sensitive subjects, skin conductance measures showed depressed activation and

increased reaction time. They state that air ions are charged molecules of high physical energy created by a variety of sources, including nuclear radiation and high-voltage direct current lines.

Ken Langford pointed out that he had read articles about ionization of the air before earthquakes.

c. Ore T, Casini V. Electrical fatalities among U.S. construction workers. *J Occ Environ Med* 1996;38:587-92. The authors report that there were more than 2000 electrocution deaths among construction workers from 1980 to 1991. Eighty percent were associated with industrial wiring, appliances, and transmission lines. Electrocutions are the 5th leading cause of workplace mortality in the United States.

Proper clothing during summer months may reduce the risk among construction worker. Clothing could prevent moisture that arises from perspiring skin from contacting sources of electric current. The reduced number of winter electrocutions may be influenced by workers wearing heavier clothing, gloves, and boots.

d. *Science* Vol 275; 28 Feb 1997. The cover showed an explosive eruption at Sakurajima Volcano, Japan. The explosive event is accompanied by shock waves and lightning. There are 2 articles in this issue on the subject of volcanic eruptions (Morrissey & Chouet; Vergnolle)

There are 2 categories of volcanic activity: 1) explosive and 2) the relatively more gentle, basaltic eruptions. Explosive volcanoes involve very viscous magma. The magma of basaltic volcanoes is less viscous, although it is 4 times more viscous than water. When magma is expelled from a volcano it undergoes fragmentation creating a jet of gas and magma droplets.

7. I have had phone conversations this month with Howard Goldick, PhD of the University of Hartford regarding the meeting of the American Association of Physics Teachers this August 13-16, 1997 in Denver. The AAPT will set aside time (probably a morning or afternoon session) dedicated to Lightning Topics. The deadline for abstracts (which can be 1 or 2 paragraphs) is April 7, 1997. The AAPT is composed of physicists, teachers, and researchers from universities, colleges, and secondary schools. Each speaker will have 15 to 20 minutes. So far, several members have indicated that they may be interested in participating: (Gerard Berger, Cherington, Floret, Elisabeth Gourbiere, Kithil, Langford, H. Wachtel).

Howard Goldick was referred to LDC after reaching Dan Lammertse via the Craig Hospital web site. He indicated that AAPT Program organizers were looking for topics that combine practical applications and physics.

8. Rich Kithil distributed the following:
- NLSI Activities for February 1997. Attached to the LDC minutes.
 - A memorandum for the NFPA-780-1995 regarding the safety advice for what position to assume in the event of a nearby lightning strike. Rich and Dick Reehl have written to NFPA suggesting that the wording be:
"Avoid direct contact with other people. Remove all metal objects. Crouch down, with feet together and hands on knees."
 - Handouts listing the number of deaths by natural hazards for 1940-1981; Annual USA Lightning Losses from various sources including: Insurance Information Institute; NFPA (National Fire Protection Association); NOAA/Storm Data.

9. Dick Fischer brought a copy of "Ground-Fault Circuit-Interrupter (GFCI), Technical Report published by the Consumer Product Safety Commission. This manual covers several aspects of GFCI, "an electronic device whose function is to interrupt the electric circuit when a fault current to ground exceeds a predetermined value that is less than that capable to activate the overcurrent protective device of supply circuit. Normally, the current flowing through the line into an appliance is equal to the returning in the neutral wire. When a ground fault occurs, the current returning through the GFCI is reduced by the amount flowing through the ground wire or some other ground path, such as a metal gas or water pipe...The GFCI senses this current imbalance in the line and neutral wires and quickly acts to interrupt power. In this way, the duration of shock is limited."
10. Ken Langford brought an article pertaining to "Tents and Lightning Safety." He also brought a book detailing the electrical events that have been recorded prior to and simultaneous with earthquakes. The author speaks of "earthquake lights" which may be akin to the ionization associated with St. Elmo's Fire.
11. We were fortunate to have Nicolas Floret visit us from France. Nicolas is associated with an organization that deals with Lightning Warning Systems. In addition, he is the Secretary General of APERI, an international organization dedicated to organizing Lightning meetings and establish Guidelines on lightning safety. A new draft of the document on lightning safety will be submitted at the Lightning & Mountains Conference in Chamonix, France in June. A copy will be sent to LDC as well.

Nicolas informed us of an upcoming International Meeting on Lightning Photography to be held sometime in 1998 in France. He brought brochures regarding Maison de la Foudre, a Lightning Museum in Marcenat, France which is collecting items on the history of lightning research.
12. Julie Kimberling reported that Michael Boyson has received all the data from Colorado Hospitals on outpatient lightning injuries. We can now schedule a meeting to analyze all the information we have collected.
13. Howard Wachtel reported that he will be speaking at an International Meeting in Bologna in June 1997 on magnetic field exposure and health matters. This meeting takes place one week following the Lightning & Mountains Chamonix meeting to be held during June 1 to 5, 1997.
14. Tom Wachtel told us that a tragic lightning accident involving a father and son was caught on film. The photographer, a surgeon, may visit LDC at our next meeting.
15. Barry Kamini reported that Centura should be online with a web page this spring. We may have our own web page later this year. Barry also us that Centura-St. Anthony will soon have a telemedicine "hook-up" with other facilities in the state.
16. Dan Breed told us that he will be returning to Mexico this summer to continue NCAR experiments on rain producing clouds.
17. Near the close of the meeting we viewed: 1) photographs of lightning taken by Carl Swanson; 2) a videotape provided by Ken Langford. The videotape was made by Duncan Blanchard and dealt a) with volcanic eruptions in the sea; b)

jet drops. Much of the tape footage was taken 20 miles south of Iceland in 1963. Blanchard also demonstrated laboratory experiments utilizing samples of sea water, lava, and heat to produce "clouds."

18. Enclosed are copies of pictures of members present and the birthday cake taken last month on the Anniversary of our 5th birthday.
19. Next meeting: Friday, April 11, 1997 at 11:30 am in the Main Auditorium of St. Anthony Hospital Central.

Respectfully submitted,



Michael Cherington, MD
Chairman, LDC

