

LIGHTNING DATA CENTER Minutes  
St. Anthony Hospital, Denver

May 10, 2002

Quote of the Month:

"In early December a blizzard swept in off the plains and struck with what was measured on the flats as twenty-seven inches of snow. This was the first in what became nearly a weekly cycle of snowstorms, some of the driven by lightning, a confounding phenomenon. Dr. Nokes, a medical student through much of the Great Depression, said he recalled lightning and snow mixed only once before, during a week of examinations; he said the snow came down not in flakes but the approximate shape and size of corn kernels....I thought that was an awful lot to remember from something as simple as lightning in a snowstorm."

Leif Enger in *Peace Like a River*, 2001

1. Meeting began at 11:30 am and adjourned at 1:15 pm.
2. Members present: Benson, Bradley, Breed, Burrows, Cherington, Foley, Glancy, Hodanish, Keen, Langford, Larson, Lines, McDonough, Miller, Olsen, Wachtel, Yarnell.
3. I brought the following article from the literature (abstracted in part here):

- a. Lin C-J, Yang C-H, Yang C-M, Chang K-P. Abnormal electroretinogram and abnormal electrooculogram after lightning-induced ocular injury. *Am J Ophthalmol.* 2002;133:578-9.

"While riding a motorcycle in a lightning storm, a 39 year old man...was struck on the left forehead by a bolt of lightning, which resulted in localized second-degree burns, loss of consciousness, and bloody otorrhea...Although fundus photographs and fluorescein angiography show only an area of punctate leaking, electroretinogram changes sometimes precede ophthalmoscopically visible fundus diseases."

4. Dick Burrows brought the May/June 2002 issue of *Weatherwise* magazine. In that issue there was a most interesting article by N D'Alto -- *A Stroke of Genius: On its 250th anniversary, Benjamin Franklin's famous kite experiment reveals the science behind the folklore.* Phil Krider is quoted as a source in that article about Benjamin Franklin.
5. Phil Yarnell told us that a friend, who is a Dean at a college in Montana, spoke to him about prairie animals killed by lightning. He states that when lightning is the cause of death, the animal is noted to have a white powder substance on the nostrils and mouth. The chemical nature of the powder is not yet known. I mentioned Chris Andrew's research on sheep and his assertion that the orifices of the head (eyes, ears, nostrils, mouth) are probable portals of entry for lightning current. Several members suggested that an analysis of the powder might be enlightening.
6. Several members (Wachtel, Langford, Breed, Foley, Cherington) continued a discussion from last month during the Q & A section of Gerard Berger's talk.

Howard Wachtel had introduced the term, invisible lightning. He asked: could a small streamer make connection with ground without being visible? I asked: what is the definition of lightning? Ken Langford and Dan Breed stated that there are two components:

1. An electric discharge that propagates near the speed of lightning;
2. A plasma wave that establishes the visible part of lightning.

Ken answered the question about what happens to that part of the lightning "fork" that does not meet ground. Ken said that there was retrograde flow of current to and then through the main channel.

7. Dick Burrows announced that the State Climatological Office in Fort Collins, Colorado, was engaged in a rain and hail study. Dick stated that a similar study was being initiated in Jefferson County. They might also study the impact of lightning in that county.

8. Our guest speaker was Maury Miller, Deputy Coroner/Investigator of Larimer County. The Larimer County Coroner's office is unique. The office investigators are all certified police officers. His topic was Lightning and Forensic Sciences.

Maury gave an outstanding presentation that evoked much discussion. He presented 3 fatal lightning cases. Each had Lichtenberg figures on the skin. The Lichtenberg figure is pathognomonic of lightning strike. In one case the ferning pattern was more prominent 22 hours after it was first seen. One question raised during the Q & A period: Is there a pathological sign or pattern of internal organs that is unique to lightning? Phil Yarnell, Gil McDonough, and I believe that there is no unique histologic sign characteristic of lightning strike or electrical trauma.

Steve Hodanish raised another topic that sparked considerable discussion. Steve asserted that since metal objects do not "attract" lightning, it was unnecessary to drop metal objects (golf clubs, jewelry, etc.) during lightning storms. Ken Langford and Mike Foley suggested that if an individual was in contact with metal objects and then was touched by electrical current, the current might well take that "path." It was the consensus of the group, that the prudent action would be to drop and remove metal objects during a lightning storm. Everyone agreed that better planning would be preferable so that one is not in harm's way.

Another "controversial" safety recommendation is that of the "last resort posture" of crouching on the metatarsal bars of the feet, feet together, (baseball catcher's position) head down, with hands covering the ears. Everyone agreed that it would be difficult for a person to maintain that position for more than a minute or so. Gil McDonough suggested that because of the difficulty of maintaining that posture, it might be more practical to have one knee on the ground. Gil (rheumatologist) stated that knee is relatively "avascular" as compared to the foot, and current might travel from knee to foot. Again, everyone was in agreement that more proactive measures, seeking safe shelter earlier, etc. would be preferable than to be caught in these "last resort situations."

9. These minutes do not represent official positions of LDC. They reflect comments of members in attendance.

10. Our next speaker, Dr. Charles Mains, Medical Director of Trauma Services.

11. The next meeting will be on Friday, June 14, 2002 at 11:30 A.M. in the Main Auditorium at St. Anthony Central Hospital.

Respectfully submitted,

Michael Cherington, MD