

LIGHTNING DATA CENTER
Minutes
April 14, 2006
St. Anthony Hospital, Denver, CO
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Quote of the Month:

“Columbus was deeply troubled. To his trained eye the oily seas, cirrus clouds, and preponderance of marine life were signs of an approaching storm. He didn’t have the benefit of a barometer but his rheumatic joints ached, which told him the air pressure was doing odd things. The air felt funny and the tides weren’t following their usual predictable patterns. Not even Columbus realized that he had discovered the phenomenon that would later be known as the hurricane.”

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“Rain, thunder, and lightning was so continuous that it seemed the end of the world, Columbus wrote.”

Martin Dugard in *The Last Voyage of Columbus*, Little Brown, 2005

1. Meeting began at 11:30 am and adjourned at 1:25 pm.
2. Members present: Burrows, Cherington, Flanders, Gahagan, Gift R, Gift Y, Langford, McDonough, Mullan, Nibbe, Seybold, Swanson.
3. I brought the following articles (some abstracted here):
 - a. Pimperl C. Radiation as a nervous system toxin. *Neurol Clin* 2005;23:571-597.
“Exposure to varying levels of radiation produces varying levels of absorbed dose within the body the standard unit being the gray (Gy) the effective dose standard unit is the sievert (Sv). For purposes of this article, 1 Sv can be assumed to reflect 1 Gy. Acute radiation syndromes occur with single whole-body exposures in excess of 1 to 2 Gy. Exposure is characterized by severe effects on the CNS at higher doses of more than 50 Gy, with death occurring within 10 to 36 hours after exposure. Postmortem studies reveal extensive endothelial cell injury.”
 - b. Cherington M. Chapter 30 Lightning Injuries. In Neurology and Trauma 2nd Edition. Ed R W Evans. Oxford Univ Press 2006;559-565.
 - c. Jeff Sellon sent us Newsletters from RMEL. They include the following:

*Notice of Transmission Webcast on May 9, 2006 on
"Review of the EMF from Power Lines and Possible Biological
Effects."

*Safety Webcast: "Safety Comes First" August 8, 2006.

4. At the March LDC meeting, there was a lengthy discussion about delayed medical syndromes following lightning strikes. In response to that meeting, Steve Marshburn sent an email on the subject. Gil McDonough commented that there are some syndromes and conditions where there is little or no controversy about the cause and effects related to the lightning strikes. He gave the development of cataracts as a known complication. Al Nibbe told us about Navy experiences where sailors developed cataracts after exposure to the new technology, radar. Al referred to this situation as "extremely low frequency" {ELF} radiation hazard.
5. Carl Swanson showed us his recent photographs of the damage to a tree in Aurora, CO from a positive lightning strike. His photographs included shrapnel fragments of the tree over 50 feet away. No one in the meeting could recite a case where a person was damaged from tree shrapnel. There are many examples of people under a tree suffering cardiac arrest during a lightning strike. Ken Langford suggested that an enormous blast effect that sends tree shrapnel a far distance, might also carry a person away from the tree.
6. Robert Gift and Carl commented that there have been no lightning storms so far this year in the front range of Colorado. They said this is the first time in years when no lightning storms have occurred by April 14. There have been storms in the Eastern plains.
7. Dr. Ryan Blumenthal was kind to send us a DVD of a South African TV documentary on lightning. It was an outstanding program lasting about 12 minutes. Three lightning strike survivors were interviewed. Others on the program included Ryan, a representative of the South African Weather Service, and a Professor of Electrical Engineering.
8. Today's main presentation was given by Ken Langford. The title of his presentation: Lightning Streamers. His discussion and the photographs were outstanding. I cannot do justice to talk in these minutes. Here are annotations from my notepad.
 - a. Lightning "flash" consists of: stepped leaders, channels, dart leaders, return stroke.
 - b. Lightning "bolt" is a colloquial term, not a technical one. By contrast, "bolt from the blue" is a technical term.

- c. "Streamer" is a non-technical term for a visible, self propagating upward moving leader. David Gahagan, Gil McDonough, and Bill Seybold referred to articles by Dwyer regarding role of cosmic rays and 'runaway electrons' in initiating lightning.
 - d. Lightning rods function by encouraging the formation of streamers in a controlled location.
 - e. Can streamers cause injury? Answer is unknown.
 - f. Maximum diameter of lightning flash = 2 cm.
 - g. Other streamers occur in close proximity to the eventual lightning flash.
9. These minutes do not represent official positions of LDC. They simply reflect the comments of member present at the meeting.
10. Next month's meeting: 11:30 am on Friday, May 12, 2006 in the Main Auditorium of St. Anthony Central Hospital. Scheduled speaker is Gary Flanders.

Respectfully submitted,

Michael Cherington, MD