

October 8, 1999

Quote of the Month:

"Thy eye Jove's lightning bears, thy voice his dreadful thunder, Which, not to anger, is music and sweet fire."

William Shakespeare in *Love's Labor Lost Act IV*

1. Meeting began at 11:30 am and adjourned at 1:25 pm.
2. Members present: Barron, Bergschneider, Cherington, Clark, Foley, Glancy, George, Gray, Hasty, Hawkes, Hodanish, Hodge, Kamin, Kithil, Lammerste, Mason, H. Wachtel, Yarnell
3. I brought the following articles from the literature:

A) Holle RL, Lopez RE, Zimmermann C. Updated recommendations for lightning safety - 1998. *Bull AMS* 1999;80:2035-41

This is an outstanding, succinct article that will be widely read.

B) Arevalo JM, Lorente JA, Balseiro-Gomez J. Spinal cord injury after electrical trauma treated in a burn unit. *Burns* 1999;25:449-52.

"Among 435 burn admissions to our Intensive Care Burn Unit, 57 (13.1% of all admissions) were caused by electrical injuries..We identified 2 cases..with signs of spinal cord injury....Whether corticosteroids or other forms of rehabilitation, such as short waves and electrostimulation, are effective, remains to be determined."

C) Conrad L, Clinical update on lightning injuries. *Wilderness Environ Med* 1998; 9:217-22.

This fine clinical summary was discussed at last month's meeting.

4. Phil Yarnell reported that 2 people were struck and killed by lightning at 6:30 pm on July 24, 1999 near Medicine Bow, Wyoming. He asked members to check newspaper reports that might have more information on these cases.

5. George Hodge brought pieces of wood that had "ferning" patterns on them. He produced the patterns by sending high voltage through the wood that had been soaked in saline solution.
6. Rich Kithil brought the book, Natural Disaster Management, edited by Jon Ingelton, 1999. The book contains Rich's chapter on lightning.
7. We were privileged to have 2 superb presentations today:

A. Lightning Strikes to Animals in the Mountains by Janet George and Russ Mason of the Colorado Division of Wildlife.

In August 1999, Janet George and Russ Mason investigated the lightning deaths of 56 elk on remote tundra near Mount Evans. They arrived at the scene by way of horseback on August 19. They believe the lightning strike occurred between August 9 to 15. The elk were found at 12,200 feet elevation near the top of a ridge. The tree line was at 11,700 foot elevation. All the elk were facing in the same direction. By the time they arrived the bodies were decomposed and attacked by scavengers.

There was much interest and discussion on this event. Here are only some of the topics covered during the discussion:

Most members believe that ground current was the path that took the elk.

Mountain scavengers who feast on such carcasses include: ravens, golden eagles, bears, and coyotes.

Jim Barron and Rich Kithil speculated that the lightning had a large horizontal component, and the soil conditions (moisture, metallic composition) may have been important contribution factors. According to Janet and Russ, the elk occupied an area of about a football field (100 yards in length).

Janet and Russ showed slides of sheep killed by lightning on May 27, 1997. Sheep often herd near fences and are then struck by lightning. The sheep were found on Kenosha Mountain. They were found shortly after the lightning strike. In the case of the sheep, burn marks were visible on the legs near the hoofs. The Colorado Division of Wildlife often study the movement of animals in the wild using collars that transmit signals. They know when the animals die when the frequency of the signal changes (increases) by a factor of two. The signal changes when the animal has not moved for more than 5 hours. Gene Lines and Rich suggested that the collars be fitted with small antennae and fuses so they could be evaluated for possible lightning damage.

B. Data on Lightning in Colorado by Steve Hodanish of the National Weather Service.

Steve has been collecting much data on lightning flashes in Colorado. For example, during the month of August, there were 153,602 cloud-to-ground (CG) flashes in the state. His data is consistent with information that many mountain climbers have known: the lightning threat grows in the late morning (11:00 am to noon) and stays high for hours.

One of the lightning flashes that he recorded was a positive CG. This flash that had long continuing current traveled 40 km. It was an example of a "bolt from the blue."

For those interested in learning more about Steve's work and data, I suggest you check his web site:

http://www.crh.noaa.gov/pub/lrg/crh_colorado_lrg_res_center.html

8. Our thanks to Janet, Russ, and Steve for their fascinating presentations!!
9. These minutes reflect the comments of the members present and do not represent official positions of LDC.
10. Next meeting: Friday November 12, 1999 at 11:30 am in the **Conference Room** on the **4th floor** of St. Anthony Hospital Central.

Please note the location change for this month's meeting only.

Respectfully submitted,

Michael Cherington, MD
Chair, Scientific Committee LDC