Minutes May 20, 1994
Lightning Data Center Provident St. Anthony Hospital

Quote of the Month:

"Bear this well in mind, and you will immediately perceive that nature **is free and uncontrolled by proud masters** and runs the universe by herself without the aid of gods. For who can be in all places at all times, ready to darken the clear sky with clouds and rock it with a thunderclap - to launch bolts that may often wreck his own temples, or retire and spend his fury letting fly at deserts with that missile which often passes by the guilty and slays the innocent and blameless?"

Lucretius "On The Nature Of The Universe" approx. 65 B.C.

1. Meeting began at 11:30 A.M. and adjourned at 1:05 P.M.

2. Members present: Bergschneider, Breed, Boyson, Keen, Kithil, Langford, Yarnell.

3. Ken Langford introduced guest Bob Henson, meteorologist and writer with NCAR in Boulder. Bob shared a secondhand news story of two storm chasers in Kansas who were struck by lightning while chasing. He will try to provide Ken with the video news report.

   Ken also reported for the absent Steve Clark that the study relating lightning incidence to the presence or absence of precipitation is on-going with no new results.

4. Rich Kithil pointed out that there is no government requirement for lightning protection to a structure. High risk facilities such a explosive repositories and fuel terminals may tend to do so out of prudence, but no requirements exist to his knowledge.

   Rich then led a lively discussion of favored lightning targets, beginning with the question: does a mercury vapor streetlight produce ionization which makes it a more favorable target? We then discussed several geographic locations in Colorado which are supposed to be natural lightning attractants. Among them: Buchanan Pass, Twin Sisters and Capitol Peak.

   Rich was a contributor to the May 1994 issue of Arbor Age Magazine, with a photo and an article about tree damage. He was also recently interviewed by NBC News for a national news story on lightning. Rich promises to bring a video about the NASA triggered lightning experiments to a future meeting. Finally, he reports that lightning is on average the most costly phenomena to the insurance industry. He reports statistics of $1 Billion per year.

5. Kevin Bergschneider brought a Denver Post newspaper article

from 4/26/94 about a lightning fatality on Capitol Peak, where three men were struck in snow caves. One was killed and the others hiked out with injuries.

Kevin and Ken also presented the latest version of the LDC logo. New revisions were suggested, and will be presented at the next meeting.

Kevin related a story of golf pro Tom Babb who was dazed by lightning inside a metal roofed car. He suggested perhaps member Warren Simmons could help us to obtain more details.

6. Phil Yarnell reported that he attempted to contact the Capitol Peak lightning strike survivors for the purpose of medical follow up, but the parties were not enthusiastic and declined to meet with him.

7. Michael Boyson Reported that his 1993 hospitalization data will be finalized in June. He confirms that 1993 was a year of minimal lightning injury, at least with regard to hospital admissions in Colorado. Members may remember that our Steve Clark had a grant to perform immediate injury location surveys in 1993, and was not afforded a single opportunity to do so. I guess that is good news for the residents of Colorado! Every dark cloud has a silver lining.

8. Dan Breed reported an article in a Cincinnati paper where a woman was suing a cable company for damages after lightning entered her home through a dis-used and disconnected cable TV line, causing damage and injury. Ball lightning was apparently generated during this incident!

Dan shared a letter and paper from Japan's Dr. Nobu Kitagawa. The paper is entitled "Practical Methods of Minimizing Lightning Injuries On Human Bodies". Members may wish to review this paper for a future discussion.

Australia's Dr. Chris Andrews had beem in contact with Dan to express regret that he could not attend the May LDC meeting during his American visit.

9. Rich Keen confirmed that 1993 was below normal for thunderstorm days at his station in the foothills northwest of Denver. The group wonders if the number of lightning injuries in a given year has any consistent correlation to the amount of thunderstorm activity. Rich also seconds the hypothesis that Capitol Peak is a better than average lightning attractant.

Rich presented written and chart documentation of his home made lightning activity recorder. These are reproduced and enclosed for your inspection.

10. Michael Cherington was absent, and his amiable and enthusiastic presence was missed.

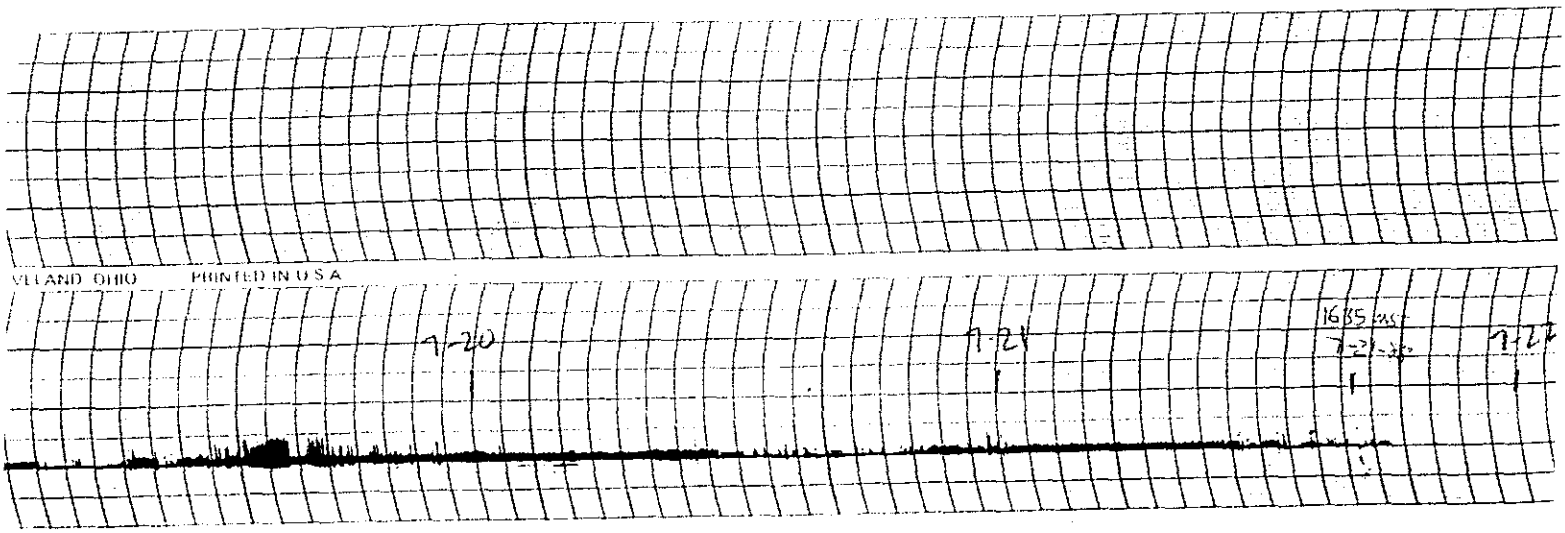
11. Our next meeting will be Friday, June 10, 1994 at 11:30 A.M. in Conference Room B at Provident St. Anthony Hospital Central. Dr. Cherington or Rich Kithil will chair.

Respectfully submitted,
Ken Langford
Chair de jour, LDC

The chart record shown below has two types of divisions: those which are drawn across the chart (curved), and those which are drawn the length of the chart (straight).

The curved lines here represent elapsed time of the record. In this case each line represents eighty minutes. Thus 18 divisions equal a full day.

The straight lines represent intensity of "spheric", (pronounced "sphere - ic") or AM radio static signal caused by lightning. Note that there are five minor divisions for each major division (copier reproduction willing). Here the 3rd major division up serves as baseline. Daytime AM radio reception of spherics has a range of about 100 miles. The closer the flash to the receiver, the greater the amplitude of an audible (and in this case chart recorded) spheric. On this record, audible thunder would fall in the third, forth or fifth minor division above the baseline, and would therefore satisfy criteria for an "official thunderstorm day". Visible lightning with inaudible thunder is someone else's thunderstorm day. Very close flashes might cause the recorder the exceed the fifth division, or in one extreme case, fuse the tip of the recorder's pen!



INEXPENSIVE LIGHTNING DETECTORS

(extracted from Skywatch East: a Weather Guide, by Richard A. Keen; Fulcrum, Inc., Golden, CO, 1992.

Here's something you can record with no instruments at all! All you need are ears. Officially, a thunderstorm occurs and is recorded when the weather observer hears thunder. It doesn't have to be raining, or even threatening. If it doesn't thunder again for 15 minutes, the next rumble (should there be one) is considered a separate thunderstorm. However, if you happen to go inside for 20 minutes and miss a few peals of thunder before going outside again, that doesn't mean the next boom is another thunderstorm. Fortunately, most thunderstorms are fairly obvious, and the 15-minute rule is usually academic and shouldn't be taken too strictly. What hour of the day has the most thunderstorms at your home? Keep records for a year, and you'll get a pretty good idea. Perhaps you can also figure out why your storms happen when they do. It's an easy, interesting and cheap weather project.

As mentioned in the Thunderstorm chapter, an easy way to judge the distance of the storm (in miles) is to count the seconds between the flash of lightning and the arrival of the thunder, and divide by five. Usually thunder can be heard up to eight or 10 miles away, depending on the lightning's altitude and intensity, the wind direction, the terrain, the general noisiness around your ears, and whether or not you were paying attention. To detect thunderstorms at greater distances, listen to the crashes on static on an ordinary AM radio. After a while, you'll be able to gauge the distance and intensity of the storm by comparing the static level to your favorite local station.

If you want to get scientific about it, tune the radio between stations, take the audio output from the earphone jack, rectify it (from AC to a DC signal) with a "full-wave bridge rectifier" (Radio Shack #276-1152 or equivalent) and filter it with a capacitor (a couple of millifarads will do; Radio Shack #272-1020 or equivalent), and read this rectified, filtered output on a milliammeter. If your radio has a signal strength meter, or "Vu-meter", you don't need to tinker - just read the strength of the static on the meter. (The rectified output can also be connected to a pen-and-ink chart recorder to provide a continuous and permanent record of nearby lightning activity.) Radio static can give advance warning of an approaching storm long before you hear the thunder, and the meter indicates how close the storm is. Another trick is to rotate the radio until the static level drops off or disappears. At that point, the radio's antenna (usually a black rod with copper wire coiled around it, running lengthwise inside the case) points directly at the storm. You'll have to guess which end of the antenna is doing the pointing. Years ago the Forest Service used direction-finding radios to locate lightning storms for fire fighting purposes. Now, you can use your radio to wisely decide when to shut off your computer or get out of (or off of) the water.