

Minutes May 10, 1996 Lightning Data Center Provenant St. Anthony Central

Quote of the Month:

"The Laplace hypothesis...seems to require that small causes have small effects: that a small inaccuracy in the starting data should lead to only a small error in prediction. This property is exactly true only for linear systems, for which--by definition--effect is proportional to cause.....Physics and mathematics have traditionally concentrated on linear systems, for the very good reason that they are predictable and mathematically tractable. The world, however, is non-linear...Non-linearity is necessary for, and is fundamental to, chaos, but it can also endow stability...The discovery of chaos is often ascribed to Lorenz, who was interested in weather forecasting by computer.

"Basically, weather is caused by a traffic problem in the earth's heat balance...Solar energy is primarily absorbed at the surface, heating it up...The warm air..tends to rise..For convection to occur, the air rising in one location must sink back in another. Rising air means low pressure and rain, sinking air means high pressure and fine weather, so the resolution of the traffic problem is at the heart of the problem of weather prediction....

"Problems such as the spread of disease involve spatial complexity which adds, literally, new dimensions to the already rich phenomenology of dynamical chaos."

W J Firth in British Medical Journal 1991

1. Meeting began at 11:30 am and adjourned at 1:45 pm. Our usual format was changed because of the presentation of our guest speaker, Mary Ann Cooper, MD. We had a brief round table discussion until noon at which time Dr. Cooper gave her talk.
2. Members present: See attached list.
3. Roger Rewarts, Safety Officer of St. Anthony Hospital, announced that a Safety Awareness Seminar will be held on Thursday, June 6, 1996. He invited LDC to participate. Five LDC members will represent us. The group will be headed by Rich Kithil and include: George Hodge, Ken Langford, Gene Dowell, Dave Breggin.
4. Rich Kithil distributed a first-rate and practical booklet entitled, Lightning 101: An Introduction.
5. I announced a message from Jerry Cusack. Jerry could not attend today because he hurt his back while on the tennis court. He did want to remind us about an upcoming television program: Wonders of Weather on The Learning Channel on Wednesday, May 29 at 7 PM.
6. Rich Kithil, acting in behalf of the LDC, presented to the Chairman a wonderful tee-shirt imprinted with a likeness of Benjamin Franklin, a lightning bolt, and the words Lightning Data Center. I am very grateful for this award. The tee shirt can be seen this weekend on the jogging paths of the Highline canal.
7. Howard Wachtel introduced the subject of the possible damaging effects of lightning by induction on people who are in close proximity to the flash.
8. Phil Yarnell asked the question: By what mechanism does electrocution damage the nervous system? Any mechanism other than thermal damage? Mary Ann Cooper pointed out that Raphael Lee has shown that cell membranes that are damaged by electroporation do not involve thermal injury because the heating

is minimal.

9. The main item on our agenda today was a presentation by Dr. Mary Ann Cooper, Associate Professor at the University of Illinois at Chicago. The title of her talk was "Myths, Mirages & Miracles." She gave an outstanding talk that generated a lively question and answer period. Included with this mailing are copies of Dr. Cooper's handouts that she provided at the meeting. I also recommend her recent articles in the Seminars in Neurology, and her classical article in the Annals of Emergency Medicine 1980;9:134.

I will not attempt to recite her entire presentation here, but will attempt to chronicle some of the subjects that she discussed. (I should mention that the following survey is based on my notes and my interpretation of Dr. Cooper's comments, and not a verbatim recapitulation of her remarks.)

a. Dr. Cooper stressed that there is "nothing magical about the nature or treatment of lightning injuries. Her comments tended to demystify the concept of "suspended metabolism" in cases of lightning strikes that was used to justify the application of "prolonged CPR."

b. According to her 1980 article the fatality rates for lightning victims was about 30%. According to subsequent data from Chris Andrews work the fatality rate was about 20%. Since known cases most likely underreport the very mild cases, the actual fatality rate is probably 5 to 10%.

c. Almost all fatalities in lightning injuries are due to cardiac arrest.

d. When treating an lightning emergency do the following: Check airway, breathing, circulation, vital signs, level of consciousness, for blunt injuries, burns, the eyes and ears. Word of caution: pupillary abnormalities may be misleading as a sign of central nervous system problems because of possible local eye injury.

e. She discussed her clinical observations of primary and secondary arrest. Following a cardiac arrest, the heart rhythm may re-establish itself. However, because respiratory arrest may last for a longer period of time, hypoxia may be responsible for additional cardiac abnormalities. Since there may be a small amount of blood reaching the brain in the absence of a detectable pulse, she recommends effective CPR methods (not because of suspended animation myth as mentioned above.) Her clinical observations regarding cardiac and respiratory arrests have been strengthened by the laboratory studies of Chris Andrews. His experiments using sheep revealed that the respiratory center was at special risk.

d. Patients with evidence of burns in the cranial territory had a 3 to 4 times higher mortality rate.

e. Common longterm sequelae include: headache, dizziness, neuropsychological effects. The Lightning Strike and Electric Shock Victims, International, and other support groups, can be very helpful.

f. Burns consist of several types: linear (may be related to sweat steam), punctate, feathering, thermal, deep burns (rare), and combinations.

10. There are two future international meetings that should be of interest to LDC members: a) Society for Physical Regulation in Biology and Medicine in Chicago,

October 9-12, 1996. The deadline for abstracts has been extended to June 1.  
To all those who wish to submit an abstract, please send a copy to Dr. Cooper.  
b) Lightning and Mountains meeting in June 1997 in Chamonix, France.

- 11. Next meeting: Friday, June 14, 1996 in the Main Auditorium of St. Anthony Central Hospital.

Respectfully submitted,



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**New names for the Lightning Directory**

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