**A Look at Nature**
**"The Snows of Yesteryear"**

The blizzard of 2003! The big dump. The 100-year snowstorm? It was probably close to that. But long-term climate studies indicate that storms like this, at times, are more the norm in the spring than the exception. And some would argue that the past 150 years have been milder than average when looking at a longer period of time, say the last 3,000 years.

The benchmark storm for our era occurred on April 14 and 15, 1921. A total of 95 inches of snow was recorded at Silver Lake in the City of Boulder Watershed. This storm set the North American record for snow in a twenty-four hour period: 76 inches fell on April 14. (Note: In 1997, Montague, NY, received 77" in twenty-four hours, but this number was disallowed by the National Climate Extreme Committee as the folks in New York added 6 measurement totals [the number of times they cleared their measuring site], two more than the maximum allowed. Too bad.)

Another major snow event of the last century occurred in December of 1913. Over a five-day period Denver received nearly four feet of snow and Georgetown recorded 86 inches. Boulder received 43 inches from December 4 through 11. The Switzerland Trail Railroad had trouble keeping the route open between Boulder and Eldora and Ward that winter. As reported in the *Boulder Tribune* (December 12, 1913), "After bucking snow from noon Monday to 5:30 Tuesday morning, the DB&W Railroad company has finally succeeded in opening up its line from Boulder to Eldora. Drifts over 20 feet high were encountered by the train from Sugar Loaf station to Eldora." The train was loaded with over 50 miners, some of whom had been stranded in Boulder for a week. Snow and cold weather continued throughout that winter and into spring, which made life difficult for the railroad and mountain residents.

Most major snowstorms on the Front Range are spring storms. Generally sometime in March the jet stream and westerly storms, which dump most of their snow on the other side of the Continental Divide, migrate north. This allows for low-pressure storms (sometimes called cut-off lows) to drift across Arizona and New Mexico. They pick up moisture from the gulfs of California and Mexico, which is driven into the Front Range from the east, the clouds dropping their moisture as they rise and cool. These are called upslope storms.

Local archeologist Jim Benedict has been studying how periods of increased upslope storm activity may have affected early inhabitants of the Front Range high country and their game animals over the past 3,000 years. He has found a correlation between incidents of low levels of human use of the high country, based on radiocarbon dates from prehistoric campsites and game-drive systems, with periods of high amounts of persistent snow (covering the ground for up to 40 weeks of the year in alpine areas), as indicated by lichen snowkill. He speculates that these periods saw greater amounts of spring snowstorms, combined with colder temperatures. One of the consequences of the greater snow cover was a major die off of elk, bighorn sheep, and mule deer, which in turn made the area less attractive to prehistoric people for periods of time until the game numbers recovered.

There are written accounts documenting a spring snowstorm that resulted in mass game die offs on the Front Range. It occurred in 1844. Accounts from trappers, traders,

and Native Americans provide some testament to the event. Ceran St. Vrain reported over 11 feet of snow south of Colorado Springs. Almost six feet of snow fell near Denver, and Native American tradition, possibly referring to this event, placed the snow at "two ponies deep." Accounts of mass die offs of bison, elk, deer, and antelope along the Front Range were numerous. Herds of buffalo and antelope walked round and round in the deep snow until they died.

The evidence suggests that for high elevation localities snow and cold may be greater limiting factors than drought. Our mountain bird populations also exhibit this trend. I have been looking at the first 20 years of data from the Indian Peaks Bird Counts. There is a positive correlation with temperature (warmer weather equals more birds and the summer of 2002, very much a drought year, produced our record high for breeding birds), while more precipitation and cooler temperatures equal fewer birds.

While everyone has been focused on the effects of drought over the past several years, down the road it may be the return of the snows of yesteryear that again drive most large animals, including humans, out of the mountains.

Dave Hallock

(Note: For a good scientific account of the possible impacts of large snow events on man and animals, read the following paper by James Benedict: Effects of Changing Climate on Game-animal and Human Use of the Colorado High Country (U.S.A.) since 1000 BC, in *Arctic, Antarctic, and Alpine Research* Volume 31, No. 1, 1999, pages 1-15.)