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Science, Beliefs, and a Changing Climate

Some of the first English language reports of North American rangelands are the journals of Zebulon Pike. In August 1805 he led an eight-month military expedition north from St. Louis to search the headwaters of the Mississippi. Then in July 1806 he went west in an attempt to find the source of the Arkansas and Red rivers. After reaching the Rocky Mountains near Pikes Peak, he turned south.

He was captured by Spanish dragoons near Santa Fe. He was sent as a prisoner to Chihuahua with a company of Spanish military guarding a flock of 15,000 market wethers. The governor accepted Pike's explanation that he had been lost. They sent him under armed guard across Texas territory. He arrived at Natchitoches on 1 July 1807. From there he returned to St. Louis.

Pike's description of vast grazing lands, huge herds of buffalo, wild horses along streams, and a flourishing sheep business in New Spain excited livestock investors like bees on a watermelon. After the Civil War the army pacified the Indians through the extirpation of the buffalo. Then cattle and money came.

H. L. Bentley of Abilene, Texas, in his classic US Farmer's Bulletin No. 72, described the rapid change in the west in 1898.

Men of every rank were eager to get into the cow business. In a short time every acre of grass was stocked beyond its fullest capacity. Thousands of sheep and cattle were crowded on the ranges where half the number was too many. The grasses were entirely consumed; their very roots were trampled into the dust and destroyed. In their eagerness to get something for nothing, speculators did not hesitate at the permanent injury, if not total ruin, of the finest grazing country in America.

Problems of the livestock industry were blamed on drought. When the rains came damaged rangelands were restocked. Land-hungry settlers proofed-up on homesteads and plowed sod that remained. By the 1930s, the land Zebulon Pike described as seas of grass was blowing dust (see Jim Thorpe's review of *The Worst Hard Time* in this journal).

Don Hartley, whose diary is the basis for *The Worst Hard Time*, wrote in April 1935: "The whole country is rapidly becoming an area of shifting dust and sand, blowing South one day and North the next. Fences, in some places, are covered with drifting, blowing dirt" (p. 245).

Again, the disaster was blamed on drought. But government policies shifted toward reclamation and adapting to the new conditions by establishing agencies such as the Soil Conservation Service and Bureau of Land Management. Professions such as ours formed. Story tellers tied people, policies, and land together. John Steinbeck in *The Grapes of Wrath* describes an Oklahoma bank foreclosure.

And now the squatting men stood up angrily. Grandpa took up the land, and he had to kill the Indians and drive them away. And Pa was born here, and he killed weeds and snakes. Then a bad year came and he had to borrow a little money. An' we was born here. There

in the door—our children born here. And Pa had to borrow money. The bank owned the land then, but we stayed and got a little bit of what we raised.

We know that all that. It's not us, it's the bank. A bank isn't like a man...That's the monster.

Sure cried the tenant men, but it's our land. We measured it and broke it up. We were born on it, and got killed on it, died on it. Even if it's no good, it's still ours. That's what makes it ours—being born on it, working it, dying on it. That makes ownership, not a paper with numbers on it.

We're sorry. It's not us. It's the monster. The bank isn't like a man.

The dust bowl was exacerbated by drought—temporary climate change. But it was human action interacting with a variable climate that caused the cattle die-off of the 1880s and the Dust Bowl of the 1930s.

In the last 100 years our science has improved. We have gotten much better in measuring change and predicting its consequences. The best scientists we have, using the best science available to them, tell us the earth is warming. Indications are this change is caused by humans as surely as the overgrazing or plowing up a prairie was human caused. Some people do not accept that or believe the reports. In my home state I get negative comments every time I write about climate change.

A 3 March 2008 headline on the front page of the Salt Lake Tribune stated “Climate Change a Risky Topic in Utah Schools.” The story reported that Utah’s secondary school science curriculum suggests teachers introduce students to ways the earth’s climate interacts with and is altered by plants and animals. But when Midvale Middle School showed an Academy Award-winning movie made by a Nobel Peace Prize winner (Al Gore’s “An Inconvenient Truth”) without “advanced parental notice” parents criticized the teacher for being “an advocate” and making science “political.”

The newspaper suggested that the religious right had switched its attack against science from evolution to climate change. Several court rulings found that “intelligent design” did not qualify as a science acceptable for classroom instruction.

In a 4 March 2008 column in the Logan Herald Journal, Calvin Peterson wrote the percentage of Americans believing in the theory of evolution is declining. He cited a poll showing that in 2005, 55% of those interviewed thought intelligent design should be taught alongside evolution. He quoted a recent survey of 34 nations’ belief in evolution showing the United States ranked 33rd. Only Turkey ranked lower. He said some authors relate this to fundamentalism in Christianity and Islam.

My own quick internet search indicated widespread doubt of climate change in spite of strong scientific evidence to the contrary. But an even more disturbing trend is a general disregard for science. An attitude exists that beliefs are more important than facts in science, economics, and life’s decisions. Not only has this attitude led to politicizing important global issues such as climate change and evolution, but it has created political wedge issues dealing with end-of-life care, homosexuality, stem-cell research, hereditary diseases, and other issues.

America is falling behind in science education. Our high school graduates cannot compete in the global economy. State legislatures scramble to enact bills that will enhance recruitment and salaries of science and math teachers. Yet, they fail to support schools in teaching the ability to evaluate and apply science. Home schooling and private schools spring up, in a large part to keep students from being exposed to concepts of evolution, climate change, or associating with students different from themselves.

This issue of *Rangelands* is devoted to climate change. For whatever reasons, there are people who do not believe the climate is changing—or maybe it is just too uncomfortable to think about. Being able to do our job will depend on understanding our science well enough to teach others which problems are real.

The lead paper in this issue suggests our role in addressing problems of climate change will fall into two areas: mitigation and adaptation. We have a pretty good track record in adapting to change. We understand interaction and interconnections as well as any group. Anyone driving along Zebulon Pike’s old route will see the land is no longer blowing as Don Hartley described it. You won’t see many buffalos or small family farms, but the land is stable. If the models for climate change are correct, or even if they are not, we should be able to keep options open.

How we fit into mitigation is a lot fuzzier. Carbon sequestration and offset exchanges are based on understanding huge systems where much research is needed on individual processes and functions of large systems. Economic interactions are globally complex. With enough time and investment in science, these problems can be understood. But markets often arise before science is available. Investors flock to carbon trading like get-rich cattlemen to the Great Plains in 1860.

Cattle or carbon can be traded without knowing much about the earth. The belief that a free market can solve a problem before the science is known is quite scary, as is the fact that a growing number of people think beliefs are more important than science in solving life’s problems. But for the land to be stable, and future generations to have options to use it sustainably, managers must be able to base their decisions on good science.

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