The Rainmaker

Even before I graduated with my B.S. in Physics from the University of Missouri at Rolla I had decided I wanted to be a college professor someday. I had an American Literature teacher in my junior year of college who inspired me with his teaching skills. He was an admirer or Ernest Hemingway and loved acting out many of the stories he taught. I decided that I would like to be able to inspire students as he did, only in science.

I found that one of the reasons many college professors are so dull is that they essentially regurgitate the same material they received as a student and seldom contribute anything new from their own experience. This is often since they never worked in the real world, but simply took a teaching position immediately after receiving their PhD. I determined that I would teach someday but wanted to first work in government or industry for several years before I returned to the classroom. So, after graduating from Colorado State University I took a position as a research meteorologist with the U.S. Bureau of Reclamation at the Engineering Research Center in Denver, Colorado.

After three years of theoretical research at the Center and five years of field research directing the Sierra Cooperative Pilot Project (SCPP) in the central Sierra Nevada, I decided it was time to start my real career – teaching in college. It turned out that this was also a convenient time for the SCPP Project to make a change, because three major multimillion dollar contracts were coming to an end and new contracts had been awarded to start in 1982. It would be easier for a new field director to enter the project at that time and assume direction.

In addition, the first five years of SCPP had shown that the seedability of clouds in the Sierra Nevada was much less than had been initially believed. We had started the project with an overoptimistic assumption that cloud seeding in the Sierra Nevada had the potential of increasing runoff by about 30%. By 1982, five

years later, we estimated the potential at less than 5%. This was primarily due to the lack of measurable supercooled water in the clouds and the presence of large concentrations of ice crystals at low levels in the clouds due to secondary ice crystal production processes. I figured it would take at least forty years to statistically demonstrate any cloud seeding effectiveness given such small seedability embedded in a very large natural variability.

I accepted an offer to become chairman of the science division at Christian Heritage College (CHC) in San Diego, California and teach physics. CHC was a small liberal arts college which had an unusually strong science program because of its association with the Institute for Creation Research. In addition to several other science degrees, the college offered a B.S. in geophysics. Many of its graduates had entered the oil industry as exploration geophysicists.

I knew upon assuming the position at CHC that my salary would drop dramatically, and I needed to find a way to augment my income. Because of many contacts with water boards, meteorologists, and government officials in the western U.S., I thought I should have little difficulty in doing some consulting on the side. Upon arriving in San Diego, I formed a private consulting company called *Vardiman and Associates*. I intended to offer my services to evaluate the potential for cloud seeding activities and help assess the effectiveness of any operational programs.

I wrote a letter of introduction on a specially-designed letterhead covered with snowflakes containing my credentials and offered to provide consulting services. I sent it to about fifty water boards, city and county officials, and state agencies, particularly in San Diego County near my new home. I received a few replies from friends and contacts in central California and from neighboring states congratulating me on the start of my new enterprise, but not a single response from anyone in San Diego county.

I waited about six months and sent out another letter. Again, no reply. Then I called a few of the local water boards to introduce myself and received what seemed to be rather awkward rejections. It almost seemed as if someone had been talking about me behind my back. I finally gave up on the idea of a consulting business as a source of additional income. My wife started to work part-time, and I found employment in the summer. Finances were tight, but we were able to get by.

During the second or third summer I was in San Diego, I visited an old friend from my days with the SCPP, Robert Elliott, president and founder of North American Weather Consultants near Santa Barbara, California. He still maintained a home in Goleta after his company had moved to Salt Lake City, Utah. Bob invited me to lunch following a visit to confer with a professor at nearby Westmont College.

North American Weather Consultants was a well-known consulting firm in meteorology for aviation, power companies, and water boards in Southern California since the second world war. He had started his company at an old airfield in Goleta, California and had contracted with power companies and government agencies to make climatological studies and conduct field operations.

He had also conducted several cloud-seeding operations, some commercial and some research. The one he was most proud of and was able to claim high success for was the Santa Barbara Project, under contract to the Los Angeles Water Authority. His company seeded convective cloud bands which formed over the ocean and moved into the Santa Ynez Mountains along the coast just north of Santa Barbara. He also had serviced precipitation gages and evaluated the effectiveness of cloud seeding for many years.

I had worked with Bob on many occasions in association with contracts he had with the Bureau of Reclamation on the San Juan Project and the SCPP. After renewing acquaintances and enjoying a beautiful luncheon on his patio outside his

two-story Italian Renaissance home in an exclusive part of Santa Barbara, I happened to ask him, in passing, about my total lack of response when starting up my cloud-seeding consulting business in San Diego. He looked at me with a semi-amused expression and said, “Haven’t you ever heard about the Hatfield fiasco in San Diego?

I looked at Bob and replied, “What Hatfield fiasco? I don’t know what you are talking about.” Bob sort of chuckled and sat back in his chair. It looked like I was going to hear some well-known California saga that had been known to all California rainmakers but me.

“Well,” Bob began, “It was sometime in the Fall of 1914 when a fellow by the name of Charles Hatfield arrived in San Diego from back east. He was one of many *rainmakers* who traveled around the western U.S. in the late 1800s and early 1900s, promising to make it rain for a fee. Obviously, the West was a good place for this type of service because it's almost always dry here. This was long before *scientific* cloud seeding had been established based on the discoveries of ice crystal nucleation using dry ice by Vincent Schaefer in 1948 and silver iodide by Bernard Vonnegut in 1949."

Bob continued, "Rainmakers were looked upon as charlatans and quacks by most people in-the-know. Even today this attitude prevails about cloud seeders, although there are good reasons now for a more moderate view. In the early days, a rainmaker would occasionally come into a town which was particularly hard pressed by a drought and the people would be desperate for water. The community would place pressure on local officials to *do something*. When the rainmaker offered to make it rain, they would jump at the chance and offer to pay his fees. Of course, if he got his fee up front, he would often just skip town, not having made any rain."

“Is this how Hatfield operated?” I asked. “No, he said. Hatfield apparently knew he wasn’t likely to get any money up front from the City Fathers, because, although San Diego was still a relatively small city compared to Los Angeles, it was growing, and the people were pretty skeptical."

"At any rate," he said, "Hatfield offered to fill the city reservoirs, that were well depleted by the current drought, if they would pay him $10,000. That was a big sum of money in those days. Well, the city fathers apparently thought they would humor Hatfield and told him if he could fill the reservoirs, they would be more than happy to pay his fee.”

Bob was obviously enjoying telling this story. “Nothing happened for the first week," he said. "But in the second week, thunderstorms began to build all along the Laguna Mountains and drifted westward into the city of San Diego. Hatfield had built a tower to burn his proprietary chemicals along the San Diego River near the location of San Diego University today. He burned a mixture of secret chemicals and the towers assisted lofting billows of smoke into the clouds which, he claimed, would cause them to rain heavily. Within just a few days all the reservoirs were full to the brim and Hatfield approached the mayor for his $10,000.”

Bob smiled as he said, “The mayor refused to pay the fee. He claimed that the rain was simply fortuitous and that Hatfield’s "rain dance" had nothing to do with filling the reservoirs. Hatfield became incensed and threatened the mayor. He said that if the city didn’t pay him his rightful fee which it had been agreed to verbally, he would continue his seeding operations and flood Mission Valley and San Diego, much of which, at the time, was located at the foot of the valley. The mayor told him to do his best, but they wouldn’t pay a charlatan and a quack."

“Hatfield returned to his tower, burned more of his chemicals and wafted smoke skyward for another week," Bob said. "Nothing happened initially, but, into the

second week thunderstorms again began to build over the Lagunas. It rained heavily, and the reservoirs overflowed. Water flowed down Mission Valley and into San Diego, causing extensive damage to bridges, low-lying homes, and businesses.

"Word was sent out to find Hatfield," Bob chuckled. "When they located him, the Sheriff arrested him and brought him to the city officials. According to the custom of the day, they tarred, feathered, and ran him out of town on a rail. And, they still didn't pay him his fee! So, that's why you didn't get any response to your letter of inquiry," Bob said.

"Do you mean, that after all these years, people in San Diego are still familiar with that story?" I said.

"Yep. I've tried for years to interest San Diego in cloud-seeding operations, but they just won't have anything to do with it," he said. "The public has forgotten about the Hatfield incident back in 1915, but the officials on the various water agencies remember it well. They pass the story down from one generation to the next."

I wasn't sure I believed Bob about his Hatfield story. Maybe he was just pulling my leg. But, only a year or so later when I was looking at one of those exaggerated tourist maps of the city of San Diego, I noticed a figure drawn across the valley from San Diego State University near Lake Murray Reservoir. It was the drawing of a man standing near what looked like a tower with smoke rising upward. Apparently, this story had survived in more places than water agency board rooms.

As a postscript, I would add that scientific cloud seeding finally came to San Diego in the early 1990s. After about a year of debate, the San Diego Water Authority contracted with Atmospherics Incorporated of Fresno, California to conduct airborne cloud seeding operations in San Diego county for a five-year period. Tom Henderson, another friend of mine, and President of Atmospherics,

Inc., and a former contractor on the SCPP, won the contract over bids from North American Weather Consultants and several other cloud-seeding companies. They operated a radar and flew their aircraft out of Montgomery Field, not far from Lake Murray.

It will never be known if Tom's cloud-seeding operations produced any additional rainfall, but the local water agencies at least, had the satisfaction of knowing that they did their best to alleviate the latest drought. And, Tom wasn't tarred, feathered, and ridden out of town on a rail!