

THE FORTNIGHTLY CLUB

of

Redlands California

Founded 24 January 1895

Meeting Number 1,939

4PM

May 2nd 2019

The Dirty 30's: Causes of the Dust Bowl



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Assembly Room A.K. Smiley Public Library

Summary

The Dust Bowl in the Southern plains centered on the panhandles of Oklahoma and Texas. It included Colorado, New Mexico, Kansas and Nebraska. It was associated with severe drought and lasted 10 years from 1930-1939. It was caused by farming on non-irrigated dry land using gasoline powered tractors. Deep plowing destroyed the grass cover and exposed the native soil to high winter and late spring winds. The situation was amplified by heavy migration of farmers brought in by the new railroads. Exacerbated by the high fixed price of wheat in 1914, and extended by debt, and deflation caused by the depression and foreign reprisals to the Smoot-Hawley tariffs of 1929. It is likely to recur as the Ogallala aquifer is depleted by mid century.

Background of the Author

Ed Malesky was born and raised in Dearborn Michigan. He graduated from the University of Michigan in 1968 and from the University of Michigan medical school in 1972. He underwent and internship and residency in internal medicine at St. Joseph Mercy hospital and University of Michigan Hospital from 1972-1975. This was followed by a fellowship in allergy asthma and clinical immunology at the University of Colorado Medical Center and National Jewish Hospital in Denver Colorado. He practiced medicine in Redlands CA from 1977-2016, He is an avid history buff and enjoys travel and fly-fishing. He is married to the former Linda Margot Cacciaglia. They have 4 children and 6 grandchildren. This is Ed's first fortnightly paper.

Causes of the Dustbowl

by Edwin Malesky

I would like to declare that I'm a history buff, and not a for real historian. This is a distinction that I became painfully aware of as I researched this paper. Growing up in Michigan, I became aware of the dustbowl in the 1930's in High school Social Studies. I vaguely recalled that the cause was poor farming technique and drought. The multiple documentaries that I watched spoke to the pathos of the farmers and not so much to the specific causes.

The Grapes of Wrath by John Steinbeck did little to advance my knowledge on the subject. Moving to California and meeting some "Okie" migrants from the dustbowl heightened my sensitivity to the situation. Talking to some California natives informed me that their education on this topic was superior to mine. This embarrassed me and drove me to fill this hole in my knowledge.

First, some background information

*2 The Great American Desert, a term used in the 19th century to describe the western part of the great plains east of the rocky mountains in North America, to about the 100th meridian. The area is now usually referred to as the High Plains. While the High Plains are not a desert in the modern sense. ie. precipitation less than 10 inches per a year. In the older sense, "being unfit for farming" it was. The area is mostly semi arid grassland and steppe. It was covered with drought resistant grasses, Blue stem, gamma, and buffalo grass. Which held the soil in place and helped retain moisture and nutrients.

*3 The first European to traverse the southern plains was Francisco Vasquez de Coronado, in his futile attempt to find the legendary seven cities of Cibola, reputedly to be built of gold. He wrote to the king of Spain, November 20th 1540. "I reached some plains so vast, that although I traveled more than 300 leagues there were no more landmarks than if we had been swallowed up by the sea. There was not a stone or tree, nor a shrub, nor rising ground nor anything to go by."

*4 In 1877, the one armed Civil War veteran, Professor, scientist and explorer, John Wesley Powell drew a line cleaving the United States into two realms, The arid west, and the verdant east at the 100th meridian that rises up from Mexico to Canada through central Texas, Oklahoma, Nebraska and the Dakotas.

The relatively humid lands east of the line got 20 or more inches of rain per a year. The arid lands to the west received less, (Except a narrow strip along the Pacific Ocean). Conventional agriculture depends on 20 or more inches of rain per a year unless supplemented by irrigation.

Early occupants of the great plains

*5 The Comanche broke off from the Shoshone in eastern Wyoming about 1680 A.D. They acquired horses from the Pueblo Indians after the Pueblo revolt from the Spanish in the same year. They were the first group of Plains Indians to fully incorporate the horse into their culture. A Spanish observer Athanase de Mezieres reported in 1770, "they are so skilled in horsemanship that they had no equal, so daring that they never asked for nor granted a truce." They forced the Lipan Apache to flee south of the

Rio Grande, and the Mescalero Apache to Coahuila. They took captive thousands of Spanish, Mexican, and Indians, and American settlers. At their peak in the 1700's they numbered about 20,000. A mounted Comanche was the most effective warrior of the plains. In 1881 a Col. Richard Dodge believed the Comanche to be the finest light cavalry in the world. They were superior to any mounted soldiers in Europe or America. The Comanche had stopped cold the northward advance of the Spanish empire in North America in the 18th century. An empire up to that point easily subdued and killed millions of Indians in Mexico and moved at will throughout the continent.

In 1833 transplanted easterners, drawn by a promise of free land journeyed to Texas from Illinois, in exchange for promises of allegiance to Mexico. (of which Texas was apart). They were given grants of up to 4,600 acres of land in central Texas (near present town of Mexia). In 1836 the only borderland where white civilization met hostile plains Indians was in Texas. The western push by the Americans was not preceded by federal troops or federal forts, but simple farmers imbued with a fierce Calvinist work ethic. They had steely optimism and cold-eyed aggressiveness that made them refuse to yield even in the face of extreme duress. It is one of histories great ironies, that one of the main reasons Mexico encouraged Americans to settle in Texas in the 1820's and the 1830's was because they wanted a buffer against the Comanche. It was an insurance policy on their borderland. As time went on however the Comanche succeeded in pushing back the frontier. One county called Wise had seen it's population drop from 3,160 in the year 1860 to 1,450 in the year 1870. In some places the frontier had been driven back 100 miles.

*6 Bison gave the Comanche just about everything they needed, shelter, tools, clothing, protein. Their dried stomachs were used as food containers, their tendons were used as bowstrings. Tepees required 20 bison skins stretched and stitched together.

*7 In 1867 president U.S. Grant appointed General Phillip Sheridan head of the dept. of Missouri to pacify the plains. Sheridan gained his reputation by successfully defeating Confederate General Jubal Early in the Shenandoah Valley, using tactics presaging the scorched earth tactics of Sherman's march to the sea through Georgia. He attacked the Comanche's, Kiowa, and Cheyenne in their winter quarters, killing their horses and taking their supplies and killing those who resisted. In his address to the Texas legislature in 1875, in response to criticism of buffalo hunters on Indian land he replied, "Buffalo hunters have done more to settle the vexed Indian question than the entire regular army has done in 30 years." "They are destroying the Indian commissary, The buffalo hunters should kill, skin, and sell until the buffalo are exterminated, than your prairies can be covered by speckled cattle and the festive cowboy, the forerunner of an advanced civilization."

*8 Instrumental in the pushing back settlers on the frontier was Quanah Parker. He was born in 1848 and died Feb. 24th 1911. He was a half breed, the son of a Comanche Chief Peta Nocona and Cynthia Anne Parker, an anglo American kidnapped at the age of 9 and assimilated into the tribe. After the apprehension of several Kiowa chiefs in 1871, he emerged as a dominant figure in the Red River war. He clashed successfully with federal soldiers led by Col. Ranald S. Makenzie. Among other Comanches he often went on raids of a radius of 400 miles, usually under a full summer moon. He could travel 60 miles in 12 hours. Raiding

was effective in rolling back American immigration into the plains through killing, kidnapping, raping, scalping, and gruesome tortures. That's what he did, but that's not who he was. Who he was, was a realist and opportunist. He was the last chief to surrender his band of Quahada Commanche at Fort Sill, Oklahoma. in 1875. The decimation of Buffalo caused his people to starve, and the relentless attacks by the U.S. army with their modern repeating handguns and rifles put them at a serious disadvantage. He was made paramount chief by US government and met frequently with Washington politicians other other Comanche and the authorities on the reservation. He helped negotiate a treaty where significant grasslands acrued to his tribe, and rented it to ranchers to feed their cattle. He became a rich rancher himself in Oklahoma and built a large house with seven bedrooms for his seven wives. He hunted with*9 Theodore Roosevelt and was involved in his inaugural parade. He founded the Native American Church, whose rituals involved peyote, and is thought to have induced Theodore Roosevelt to create the Wichita Mountain wild life refuge. By his efforts on the warpath he delayed the devastation of the plains by the plow.

Following the decimation of the buffalo, ranchers used the planes for cattle grazing and contested with the farmers at first. Over production of beef eventually caused the price of beef to collapse and the ranchers gradually lost control of the plains to the "sodbusters" * A major influx of homesteaders into the great plains occurred with*11 the Homestead Acts. The yeoman farmer ideal of Jeffersonian democracy was a powerful influence in American Politics during the 1840's - 1850's, with many

politicians believing a homestead act would increase the number of “virtuous yeoman”.

The Free Soil Party of 1852- 1853, and the New Republican Party after 1854 demanded that the new lands opening up in the west be open to homesteading. After the South seceded and their delegates left congress in 1861, the republicans and their supporters from the upper south passed a homestead act. The homestead was an area of public land in the west (usually 160 acres) granted to any citizen who had never taken up arms against the US government, was 21 years old or head of a household, could file an application to claim a federal land grant. (Women and free slaves were eligible). The occupant had to reside on the land for five years and had to show evidence of having made improvements. The process had to be completed within seven years. A series of homestead acts were passed to encourage independent farmers and families to migrate to the great plains. One hundred thousand people in the land rush of 1893, when the Cherokee Strip was opened dashed to claim a piece of six million acres of former Indian ground. As the rush continued and the best lands were claimed, the claimed acreage rose to 320 acres and the homesteaders were forced to practice dry land farming in drought prone areas not suitable for non-irrigated farming.

in 1869, the Transcontinental Railroad was completed. in 1925 trains arrived in the southern great planes to take the farmers wheat to market, and a massive influx of new farmers led to immense land erosion and eventually to the dustbowl of the 1930's.

Among the more interesting people to arrive were the Volga Germans. They were descended from southern German peasants. Impoverished and displaced by the Seven Years War. Catherine the Great

of Russia a German herself who displaced her husband Peter III invited them to live and farm the Volga river basin in a 1763 manifesto. She offered homestead land, tax-breaks, cultural autonomy, and no military conscription. They were known as tough-nutted pacifists, a migratory people who's defining characteristic was draft dodging. They populated the south of Russia providing Catherine the Great a buffer against the Turks, Tartars, Kazakhs- Kirghz tribesman. In 1872 Alexander the II revoked Catherines promises declaring they had to give up their language pay taxes and sign up for the army. He also took away their exclusive license to brew beer.

Facing bankruptcy the railroads in the US found their salvation on the steppe of southern Russia. in 1870's 1200 Volga Germans migrated to Kansas and within 50 years 303,000 would populate the great plains. The treeless expanse of the southern plains was one of the few places that looked like home to them. Without the Volga Germans it is possible that wheat would have never had been planted on the dry side of the plains, and that may have delayed the dustbowl. They carried with them seed of Turkey Red, a hearty winter wheat (short stemmed and resistant to cold). The Russian thistle came by accident it grew so fast that it soon owned the West. In America it was known as tumble weed.

The General Plow up 1901-1930

Adequate rainfall occurred on the plains until about 1930. The farmers of the dustbowl had good harvests but failed to employ the best dry land farming techniques to prevent wind erosion ie. contour plowing, terracing,

crop rotation, cover crops, etc. After harvesting they would burn the stubble in the mistaken belief they were controlling weeds.

In 1910 the price of wheat stood at 80 cents per a bushel. *11 In 1914 the Turkish navy in World War I blockaded the Dardanelles, preventing Russian wheat from reaching the western allies. President Wilson appointed *12 Herbert Hoover the head of the Food administration and he guaranteed wheat at two dollars a bushel to support the western allies. Farmers increased their productivity by 50% during World War I. We shipped 23 million tons of wheat to the allied farmers preventing their collapse. It cost 35 cents a bushel to grow wheat. At two dollars a bushel a fortune could be made. For comparison a factory worker at Ford could make 5 dollars a day. That was considered a great deal at the time. This was 1/8th the take home pay of a wheat farmer growing 30 bushels an acre on 160 acres. Back of the envelope calculations show a profit of 7,920 dollars per year, or adjusted for inflation \$201,327 dollars in 2019.

In 1917, 45 million acres of wheat were harvested. In 1919, 75 million acres were harvested (up 70%). Expansion went on for 10 years after the war. Rains came steadily in the years 1926-1929. This led people to believe the weather permanently changed for the better. Land speculators where quick to claim, "the rain followed the plow". Horse drawn plows would barely sustain a drylands farmer. *13 *14 What changed everything was the gasoline powered tractor and combine. In the 1830's with horse drawn plows it took 58 hours to plant and harvest a single acre. By 1930 it only took a tractor 3 hours to do the same job. A tractor did the work of 10 horses. The one way plow would later be cursed as the tool that

destroyed the plains, because of its efficiency at ripping up the sod. (which held moisture and nutrients in place).

In 1925 trains arrived to take the wheat to market. With tractors, came large profits, Farmers took out loans for more lands, model T cars, appliances, and kit homes from Sears and Roebucks purchased on credit. In 1929 the US had a food surplus. Towers along the railways were full of unsold wheat. It was stacked in piles outside grain elevators. In five years time from 1924-1929 acreage in the Texas panhandle that was planted for wheat grew from 876 thousand acres to 2.5 million acres. (a 300% increase)*¹⁵By 1929 there was a glut of wheat in Europe and Russia as well. Prices head down from a \$1.50 to 75 cents per bushel. Farmers responded to the decrease in price the only way they could to pay their bills. They planted even more wheat, and hoped for a better price to pay their debts. Planting more wheat was self defeating as it reduced the price they could get for the wheat. This impoverishment increased with the deflation caused by the great depression, and foreign tariffs in response to the Smoot-Hawley act of 1929.

The only way for someone who made 10,000 dollars in 1925 to duplicate his earnings in 1929 was to plant twice as much wheat. The tractors dug up 50 to 100 acres per day in the southern plains before the land broke. There was no worse time to plow a grassland than in the fall, when it would be exposed for months to the winds of late winter and early spring. (The blow season). To have that much land naked was a gamble and the farmers knew it. At the start of 1930 wheat sold for 1/8th of the high price from 10 years earlier. At 40 cents a bushel the price could barely cover cost let alone service a bank note. Across the plains there was only one way out (a last gasp), plant more wheat. Farmers tore up

what grass was left. They furiously ripped out sod in the hopes they could hit a crop when the prices came back.

The Dust Bowl

*16 The Dust Bowl centered in the Oklahoma and Texas panhandles, and included Nebraska, Kansas, Colorado, and New Mexico. American meteorologists rated the dustbowl the number one weather induced catastrophe of the 20th century. Historians say it was the nations worst prolonged environmental disaster.

The drought began in the summer of 1930 and lasted until the onset of record rains in 1941. Farmers conducted deep plowing with gasoline powered tractors of native virgin topsoil. This displaced native deep rooted grass that normally traps soil and moisture even during periods of drought and high winds. *16 *17 During drought, the unanchored soil turned to dust with “Black Blizzards” Blowing as far as the east coast. (Black Sunday on 4/14/35), covering New York City and Washington DC. Drought and erosion affected 100,000 acres that centered on the panhandles of Texas and Oklahoma.

The widespread conversion of the land by deep plowing and soil preparation methods to enable agriculture, prevented the native grasses which held soil in place and helped retain moisture and nutrients during dry periods. Furthermore cotton farmers left fields bone dry during winter months when the winds were strongest and burned the stubble to control weeds prior to planting, thereby depriving the soil of organic nutrients and surface vegetation.

The drought dried the topsoil, and over time it became friable reduced to a powdery consistency in some places. The fine soil easily eroded and was carried east by continental winds.

The worst disaster occurred Black Sunday 4/14/35. The winds carried twice as much dirt out of the earth as was dug out to create the Panama Canal. The canal took seven years to dig, this storm lasted a single afternoon. More than 300,000 tons of the great plains was airborne that day.

At it's peak the dustbowl covered 100 million acres. Dusters swept over the northern planes as well, but the epicenter was in the Southern Planes. An area the size of Pennsylvania was in ruins, more that a quarter million people fled the dust bowl in the 1930's.

Conclusion

The disaster was ecological, economical, social, and cultural. The disaster caused people to change their farming ways, it lasted 10 years, The climate of the great plains is dry and windy. Winds reach speeds of 60 mph in late winter early spring months. The only thing that keeps the soil in place is it's vegetation. Which is thick grass that doesn't require much moisture.

In 1862 the government promised free land to anyone who would farm the prairie for five years. In 1869 the railroad brought in farmers and took out wheat.

The roots of the disaster date back to 1914 when the Turkish Navy blockaded the Dardanelles and cut off Russian wheat distribution to the west. This caused Herbert Hoover to guarantee an increase in the price of wheat from 80 cents to 2 dollars a bushel. Because of a sudden increase

in demand southern plains farmers plowed the land like they had never plowed it before. In 1920's they got new tractors and combines. In 1925 trains arrived to take wheat to market. From 1930 to 1939 rains stopped and raging winds, blew the dried soil off forming clouds of dust. As demand for wheat fell and deflation occurred after World War I prices for wheat plummeted. The farmers planted more wheat for economic needs, this was worsened by increased tariffs caused by the foreign response to the Smoot-Hawley act. In 1941 the drought ended, and farming methods changed to preserve the soil. ie crop rotation, leaving fields fallow, contour plowing and terracing. FDR created a Shelterbelt of trees 100 miles wide from Texas to Nebraska of Chinese elms, Cedars, and Ash. Conservation methods resulted in a 65% reduction in the amount of soil blowing, but

*19 The Ogallala Aquifer lies beneath the great plains, and is the size of Lake Huron at over 174,000 square miles. Large scale extraction for agricultural purposes started after World War II, Due to the center pivot irrigation system with gas powered pumps for water extraction the aquifer is at risk for over extraction and pollution. Since 1950 agricultural irrigation has reduced volume of the aquifer by about 9%. The water is slow to replenish itself, most of the water has been there since the last ice age. Once depleted the aquifer will take over 6000 years to replenish itself naturally through rainfall. Some estimates indicate the remaining volume could be depleted as soon as 2028.

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